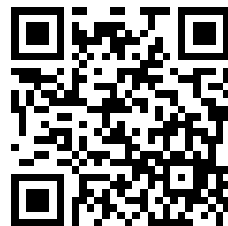


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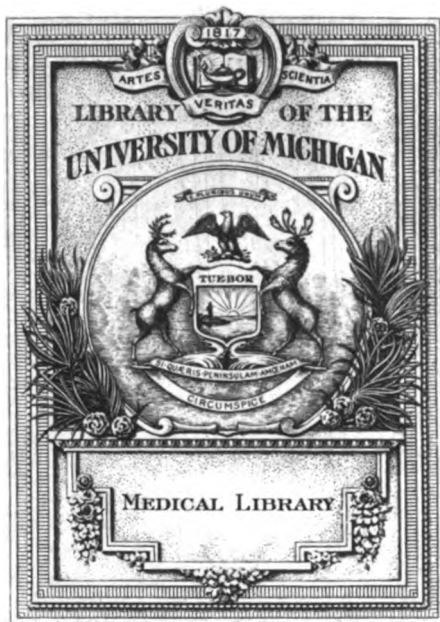
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**Journal**  
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**Royal Army Medical Corps**





# Journal

OF THE

*of the Brit. Army.*

# Royal Army Medical Corps

EDITED BY  
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No. 1.

Journal  
of the  
Royal Army Medical Corps.

Original Communications.

A TRYPANOSOME FROM ZANZIBAR.<sup>1</sup>

BY COLONEL SIR DAVID BRUCE, C.B., M.B., F.R.S., D.Ss., LL.D.,  
AND CAPTAINS A. E. HAMERTON, D.S.O., AND H. R. BATEMAN.

*Royal Army Medical Corps.*

(Received by the Royal Society, September 18th—Read November 26th, 1908.)

(From the Laboratory of the Royal Army Medical College, London.)

[PLATES 1 AND 2.]

ABOUT the middle of April, 1908, Dr. J. Rose Bradford, F.R.S., had handed over to him by Dr. Edington, F.R.S.E., a rabbit whose blood contained a trypanosome. Dr. Edington stated that he had inoculated the rabbit with blood from a horse he found at Zanzibar suffering from some obscure disease. This rabbit was handed over to one of us (D. B.) by Dr. Bradford for the purpose of keeping the strain alive and, if possible, identifying the species of trypanosoma.

The following notes have since been received from Dr. Edington. The trypanosome was found at Zanzibar, where no trypanosome has formerly been known. It occurred in a horse in a stable among others, of which none were infected. The animal was old, and had been many years in the place. At death the symptoms were like those in surra and nagana, but the spleen was not enlarged, nor was it coloured abnormally. The usual œdema was apparent and most marked in the sheath, up the abdomen, in the chest, and down the posterior limbs.

Dr. Edington inoculated a horse, an ox, and a goat successfully.

<sup>1</sup> Printed by permission of the Royal Society.



The disease ran a subacute form in the original horse, but in the inoculated one it seemed rather more acute. Inoculated on February 18th, trypanosomes were seen in its blood on the 25th, and by March 1st the sheath was swollen. There was no real fever ( $102.2^{\circ}$  F.) until February 28th, so that in this case the appearance of parasites preceded the fever. On March 7th it had greatly recovered, œdema had subsided, and the weakness of the preceding few days was recovered from. Dr. Edington left on March 8th, and fears the animal was destroyed, as they had no further vote for funds for food, &c.

A young ox, inoculated on February 15th, showed trypanosomes on the 27th. It had fever fairly high, but had recovered before he left, and trypanosomes were exceedingly few. A goat showed high fever, but its blood never showed trypanosomes at any time, although Dr. Edington hunted with very great thoroughness.

Two rabbits were inoculated, one subcutaneously and one intraperitoneally. The former was sent to Dr. Mesnil from Marseilles, but it has shown nothing. It was twice inoculated with big doses, one from a horse and one from an ox. The other Dr. Edington handed over to Dr. Bradford, and from this rabbit the trypanosome under consideration was obtained and studied.

On examining the rabbit's blood the trypanosome was found to be a small one, with poorly developed undulating membrane, and no free flagellum. The average length was only  $13.5$  microns.

Although it is impossible in some cases to name the trypanosomes from their shape and size alone, still it is evident that a trypanosome of this size, with no free flagellum, cannot be *Trypanosoma brucei*, *evansi*, *gambiense*, or several other species which need not be enumerated. The names of such small trypanosomes as *T. nanum* (Laveran), *T. congolense* (Broden), or *T. dimorphon* (Dutton and Todd), at once occur to the mind.

No doubt the tendency in naming these hæmatozoa is to multiply unnecessarily the number of species. But, on the other hand, it is just as great a mistake to lump too many species together, as has been done. If there is some well-marked difference in two trypanosomes, even if alike in shape, such as their power of setting up disease in certain animals, their mode of spreading from the sick to the healthy—it may be in one by tsetse-flies, in another by stomoxys or tabanus, or by other means—then, naturally, it is of great practical use to distinguish them by different specific names.

Again, it might be argued that if two trypanosomes were

different morphologically, but had the same effect on animals, the same distribution and the same carrier, then the two varieties for practical purposes might be included in the same species.

For example, when we have to do with *T. gambiense* we at once know that man is susceptible, that the carrier is *Glossina palpalis*, and that we must keep ourselves out of the area of distribution of this fly if we would escape infection. Theories in regard to the spread of sleeping sickness by mosquitoes, stomoxys, fleas, sexual intercourse, and such like, may, for practical purposes, be ignored. If it is *T. brucei*, then we know man is not susceptible, but that we must keep our horses, cattle, and dogs out of the area of distribution of *G. morsitans*.

The three most important questions to be borne in mind, in classifying trypanosomes, are, what animals are they capable of infecting, the gravity of the infection, and, thirdly, what is the carrier? To these may be added the morphology of the trypanosome, its cultural characteristics, if any, and, if possible, cross-inoculation experiments. If these several facts could be set down for each trypanosome encountered in Africa, then some classification of the African species might be attempted. But it is only for a few species, such as *T. gambiense* and *T. brucei*, that we have all these data. Take, for example, the case of *T. congolense* (Brodén) and *T. dimorphon* (Dutton and Todd)—most important trypanosome diseases. Lavern thinks they are distinct on account of a cross-inoculation experiment, but Brodén himself, Rodhain, and Dutton and Todd all seem to lean to their really being one and the same species. With the data at our disposal at present it is impossible to come to a definite decision.

At the present time the classification of the pathogenic trypanosomes is in a state of chaos, and we have no desire to add to the confusion. Nevertheless, we think it will be well to give a description of Dr. Edington's trypanosome, as far as we have been able to study it, in view of the fact that we are starting at once for Uganda to continue the investigation of sleeping sickness.

#### MORPHOLOGY OF DR. EDINGTON'S TRYPANOSOME.

##### (A) *Living, unstained.*

Dr. Edington's trypanosome in the fresh condition, as seen in a drop of blood from an infected guinea-pig or rat, appears short and stumpy in outline, about twice the diameter of the red blood

corpuscles, among which it slowly moves, with, as a rule, its rapidly vibrating flagellum in front. The posterior or non-flagellar extremity appears blunt and rounded off abruptly, while the anterior tapers off to a fine point. In the fresh preparation the undulating membrane is not much in evidence, though sometimes it can be seen thrown into waves. The contents of the cell are homogeneous, except for a small refractile body at the posterior extremity, which is evidently the micro-nucleus.

(B) *Fixed and stained.*

*Method of Staining.*—The method used for fixing and staining the trypanosomes is usually as follows. The blood-film while still moist is exposed to the vapour of a 4 per cent. solution of osmic acid in distilled water, to which a drop of glacial acetic acid has been added, for forty-five seconds. The cover-glass is then transferred to absolute alcohol for from five minutes to half an hour. It is then passed through grades of alcohol from 80 per cent. to 10 per cent. in distilled water. Twenty-five drops of Giemsa's stock stain (Grübler's) are now mixed with 25 cc. of distilled water. The films are placed in this, face downwards, for eight to twelve hours, then washed in distilled water, and rinsed quickly in solution of orange tannin (orange G. 1 per cent., tannin 5 per cent., in distilled water). When sufficiently decolorised, the films are washed in distilled water, dehydrated by passing through acetone, cleared in xylol, and mounted in canada balsam.

Dr. Edington's trypanosome when stained in this way appears of a pale puce colour with reddish-purple nucleus and micro-nucleus. The following detailed description must be understood to refer to this trypanosome as found in the blood of the white rat.

*Length.*—It is no easy matter to measure these small irregularly shaped bodies, and doubtless the method of measurement used will govern to some extent the result. The method used by us is simply to draw a sharp outline of the trypanosome by means of a Zeiss camera lucida, at a magnification of 2,000 diameters, and then to measure along the middle line of the body by means of a pair of fine compasses, the points of which are separated 2 mm. Each step the compass takes is therefore equal to 1 micron. Twenty trypanosomes, taken as they come, are measured in this way in each specimen, and an average of the twenty measurements taken. The following table give some of the results:—

DR. EDINGTON'S TRYPANOSOME.

No. of experiment	Day of disease	Method of staining	IN MICRONS		
			Average length	Maximum length	Minimum length
134, mouse .. ..	9	Giemsa ..	15.3	20.0	13.0
69, rat .. ..	30	Leishman ..	13.0	16.0	10.0
.. ..	30	Giemsa ..	13.9	17.0	10.0
.. ..	30	Methyl green ..	13.4	18.0	10.0
.. ..	30	Giemsa ..	15.0	18.0	13.0
.. ..	30	Leishman ..	13.5	17.0	11.0
84, rabbit .. ..	22	Giemsa ..	13.0	16.0	9.0
Guinea-pig .. ..	18	.. ..	12.5	16.0	8.0
166, dog .. ..	14	.. ..	13.0	16.0	10.0
		Average ..	13.6	17.1	10.4

For purposes of comparison measurements of *T. dimorphon* and *T. congolense* are given in the following tables:—

No. of experiment	Day of disease	Method of staining	IN MICRONS		
			Average length	Maximum length	Minimum length
<i>T. dimorphon</i>					
Mouse (Laveran and Mesnil) ..	?	Giemsa ..	13.8	17.0	12.0
116, rat (Breinl) .. ..	15	„ ..	13.8	16.0	11.0
„ „ .. ..	9	Leishman	11.3	14.0	9.0
„ „ .. ..	9	„	12.6	15.0	11.0
Dog (Harvey, Sierra Leone) ..	?	„	12.3	15.0	9.0
Cow (Smith, Sierra Leone) ..	?	„	12.4	15.0	10.0
		Average ..	12.5	15.3	10.3
<i>T. congolense.</i>					
142, mouse .. ..	7	Giemsa ..	12.8	15.0	10.0
143, mouse .. ..	5	Leishman	11.5	14.0	10.0
152, rat .. ..	11	Giemsa ..	11.6	15.0	9.0
„ „ .. ..	11	„ ..	11.5	14.0	10.0
154, rat .. ..	19	„ ..	12.6	17.0	10.0
		Average ..	12.0	15.0	9.8

*Breadth*.—On an average the breadth at the widest part is 3 microns.

*Shape*.—Dr. Edington's trypanosome when stained is seen to be of a short and stumpy shape, somewhat reminding one of a miniature electric eel. The posterior extremity is, as a rule, blunt, or rounded or obtuse-angled, but sometimes, though rarely, it is prolonged into a sharp beak-like process. The anterior end tapers more or less, and ends in a short, stout flagellum. The undulating



membrane is narrow but distinct. The flagellum arises at or near the micro-nucleus and passes along the edge of the undulating membrane. There is no free flagellum, the protoplasm of the cell and the undulating membrane extending as far as the tip of the flagellum.

*Contents of Cell.*—The protoplasm, which is stained a pale puce colour, is homogeneous in structure.

*Nucleus.*—The nucleus is oval in shape, about 2.5 microns in length, and is situated at the centre of the trypanosome.

*Micro-nucleus.*—The micro-nucleus, centrosome, or kinetonucleus is small, round, or rod-shaped, and is situated close to the posterior extremity. It stains more deeply than the nucleus.

*Undulating Membrane.*—The undulating membrane is narrow. As a rule, it is straight and simple, and does not show much tendency to be thrown into folds.

*Flagellum.*—The flagellum stains intensely. It is well marked, and does not project beyond the protoplasm of the cell and the undulating membrane. Sometimes, in faintly stained specimens, there is the appearance of a slight projection of the flagellum beyond the body; but, speaking broadly, this species of trypanosome may be said to have no free flagellum.

The conclusion to be drawn from a study of the morphology of Dr. Edington's trypanosome, *T. dimorphon* and *T. congolense*, is, that the two first resemble each other very closely, whereas *T. congolense* seems to be of a somewhat shorter and stouter form. It will also be seen that in the strain of *T. dimorphon* used there is only one form, and that the short or tadpole form described by Dutton and Todd. With regard to this, it may be of interest to quote some remarks of Dr. Breinl, to whom I am obliged for his courtesy in sending me this strain. He writes: "With regard to *T. dimorphon*, you are aware that some remarkable change has occurred in the strain between the time Drs. Dutton and Todd brought it back from Africa and we started work on it here. Whereas Drs. Dutton and Todd describe the long flagellated forms with the free flagella, Thomas and myself, Laveran and Mesnil, could not see these forms with a thin body and a long flagellum. The strain I send you in a rat is the original strain."

It is difficult to understand how this change in morphology has been brought about. It may be that Dutton and Todd were dealing with a double infection, of which one has died out. This point will require to be investigated on the spot.

Another matter for consideration is whether this name *T.*

*dimorphon* should be adhered to. It certainly seems a misnomer when applied to the strain figured above. If it should be decided to drop it, I think the compliment should be paid to Dr. Todd of naming it after him.

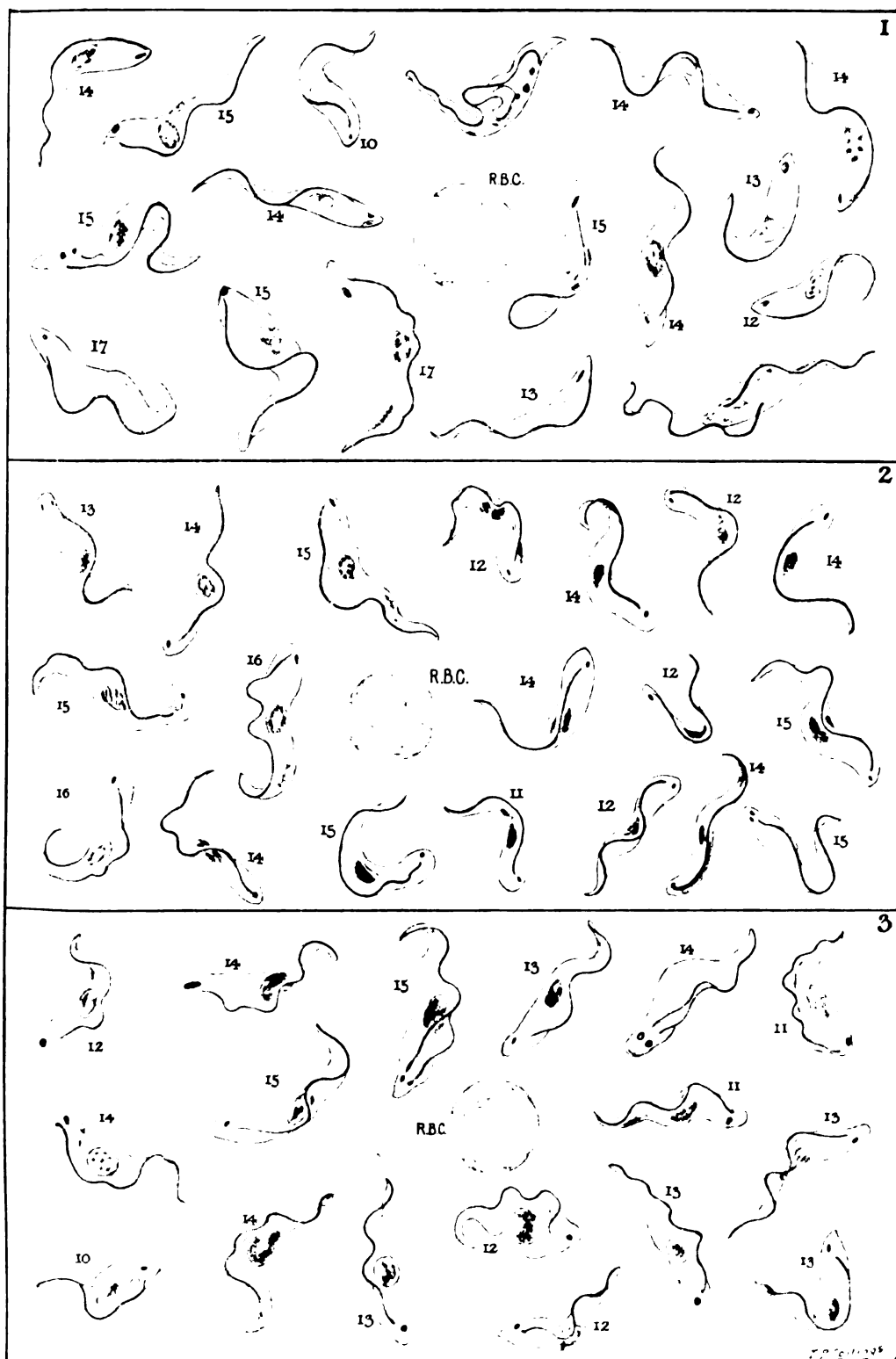
*Inoculation Experiments on various Species of Animals.*

The animals in which the effect of the inoculation of Dr. Edington's trypanosome has been studied have been horses, cattle, goats, monkeys, dogs, rabbits, guinea-pigs, white rats and mice. The inoculations were made, as a rule, intraperitoneally. Inoculation experiments with *T. dimorphon* are also given for purposes of comparison. These are printed in italics :—

No. of experiment	Source of virus	Period of incubation, in days	Duration of disease, in days	Remarks
<b>HORSES.</b>				
Edington .. ..	Unknown	Unknown	Unknown	Dr. E. thinks ran subacute course.
„ .. ..	Horse ..	7	„	Living after 18 days when Dr. E. left.
Dutton and Todd..	<i>Natural infection</i>	<i>Unknown</i>	<i>2·5 years, still alive</i>	<i>Blood still infective.</i>
„ .. ..	<i>Natural infection</i>	„	<i>1 year, still alive</i>	<i>No record.</i>
Laveran .. ..	—	„	—	<i>Horse recovered.</i>
<b>CATTLE.</b>				
Edington .. ..	Horse ..	12	Unknown	Animal looked well on 21st day.
Dutton and Todd..	—	<i>10·5</i>	<i>30</i>	<i>Two cattle.</i>
<b>GOATS.</b>				
Edington .. ..	Horse ..	Unknown	Unknown	Blood never showed trypanosomes up to 18th day.
Dutton and Todd..	—	<i>3·5</i>	<i>Well after a year</i>	<i>Two goats.</i>
<b>MONKEYS.</b>				
174 .. ..	Rat ..	3	22	Spleen enlarged. General glandular enlargement.
175 .. ..	„ ..	3	—	Still alive (Sept. 11th, 1908).
Thomas and Breinl	—	<i>4 and 6</i>	<i>160 and 75</i>	<i>Two monkeys.</i>
Dutton and Todd..	—	<i>4</i>	—	<i>Two never became infected.</i>
<b>DOGS.</b>				
165 .. ..	Rat ..	7	18	Spleen enormously enlarged.
166 .. ..	„ ..	9	15	„ „ „
167 .. ..	„ ..	7	17	„ „ „
179 .. ..	„ ..	7	14	Marked ulceration of stomach.
180 .. ..	„ ..	9	14	Spleen greatly enlarged.
181 .. ..	„ ..	7	14	„ „ „
Thomas and Breinl	—	<i>4 to 8</i>	<i>10 to 19</i>	„ „ „
Dutton and Todd..	—	<i>8</i>	<i>29</i>	<i>Average of 4 days.</i>

## A Trypanosome from Zanzibar

No. of experiment	Source of virus	Period of incubation, in days	Duration of disease, in days	Remarks
RABBITS.				
70 .. ..	Rabbit ..	25	—	Still alive after 146 days.
84 .. ..	" ..	10	—	" " " 136 "
118 .. ..	" ..	12	100	Spleen 4 inches long and much thickened.
119 .. ..	" ..	15	—	Still alive after 103 days.
120 .. ..	" ..	12	19	Spleen enlarged.
Thomas and Breinl	—	9	Acute, 26—35; Chronic, 78—157	—
Dutton and Todd..	—	13	53	One rabbit.
GUINEA-PIGS.				
82 .. ..	Rabbit ..	25	134	Liver and spleen enlarged.
110 .. ..	Rat ..	12	43	Liver and spleen greatly enlarged.
111 .. ..	" ..	19	43	" " " "
124 .. ..	" ..	21	—	Still alive after 105 days. "
125 .. ..	" ..	21	69	Liver and spleen enlarged.
126 .. ..	" ..	41	65	" " " "
Dutton and Todd..	—	6	30	Two guinea-pigs. "
Thomas and Breinl	—	4 to 15	9 to 60	
WHITE RATS.				
69 .. ..	Rabbit ..	13	30	Typical <i>post-mortem</i> appearances.
83 .. ..	" ..	10	—	Killed for cultivation experiments.
83A .. ..	" ..	11	—	" " " "
127 .. ..	" ..	7	41	Usual <i>post-mortem</i> appearances.
128 .. ..	" ..	7	36	" " " "
88 .. ..	Rat ii. ..	5	20	Second passage through rat.
89 .. ..	" ii. ..	5	—	Killed for cultivation experiments.
106 .. ..	" ii. ..	5	—	" " " "
107 .. ..	" ii. ..	4	14	Typical <i>post mortem</i> appearances.
108 .. ..	" ii. ..	7	35	" " " "
109 .. ..	" ii. ..	5	28	" " " "
102 .. ..	" iii. ..	6	—	Killed for cultivation experiments.
102A .. ..	" iii. ..	7	37	Usual <i>post-mortem</i> appearances.
121 .. ..	" iii. ..	4	37	" " " "
122 .. ..	" iii. ..	5	44	" " " "
123 .. ..	" i. ..	4	—	Rat lost.
156 .. ..	" iii. ..	7	20	Usual <i>post-mortem</i> appearances.
157 .. ..	" iii. ..	7	23	" " " "
Dutton and Todd..	—	7	36	
Thomas and Breinl	—	4 to 7	7 to 42	
MICE.				
132 .. ..	Rat ..	10	24	
134 .. ..	" ..	4	11	
137 .. ..	" ..	10	11	
Dutton and Todd..	—	5	16	
Thomas and Breinl	—	2 to 5	16 to 23 37 to 130	



To illustrate paper "A Trypanosome from Zanzibar."  
By Colonel Sir DAVID BRUCE, C.B., M.B., F.R.S., D.Sc., LL.D., and Captains A. E. HAMERTON, D.S.O.,  
and H. R. BATEMAN, R.A.M.C.





*Conclusion.*—The results of these inoculation experiments with Dr. Edington's trypanosome and *T. dimorphon* show that they act on the various animals employed in a strikingly similar manner.

CULTIVATION OF DR. EDINGTON'S TRYPANOSOME, *T. DIMORPHON*,  
AND *T. CONGOLENSIS*.

In June, 1903, Novy and MacNeal first announced the successful cultivation of *T. lewisi*. In the same year and in the following year they also succeeded in cultivating *T. brucei* and *T. evansi*. These gentlemen deserve the highest possible credit for this most difficult achievement, an achievement which most workers in this subject thought impossible. The amount of work they expended and the splendid intelligence and pertinacity with which they pursued their object, refusing to accept defeat, command the admiration of all their co-workers in this branch of biological science. Since then the trypanosomes of birds, frogs, and fish have been cultivated by the same and other workers; but these successes have only been made possible, as a rule, by the pioneer work of Novy and his assistants. Coming out of their work, mention may also be made of the very interesting and important observation made by Rogers when he grew Leishman's bodies in ordinary citrated blood into trypanosome-like flagellates.

One of the chief interests attaching to this cultivation of trypanosomes is that it may assist in separating the different species of these organisms. At the present time trypanology is in a state of chaos on account of this difficulty in differentiation. Many diseases of animals caused by trypanosomes have been reported from all parts of Africa, Arabia, India, the Philippines, Mauritius, &c., and it has often been found impossible to name the species of trypanosoma causing them with any approach to certainty.

As mentioned above, the usual method of separating the different species is by taking into consideration the morphology, the result of inoculation into animals, the cross-immunisation methods and serum diagnosis of Laveran and Mesnil, the mode by which the disease spreads from the sick to the healthy—by a tsetse-fly, a stomoxys, a tabanus, or by contact, as in dourine—by the effect of various drugs, cultivation, &c.; and, as already stated, the effect the parasite has on animals and the mode of conveyance are probably, for practical purposes, the most important. But to assist in separating the various species, cultivation has been of use in the past, and, as the methods become perfected, will be of still greater use in the future.

The following description of the cultural characters of Dr. Edington's trypanosome exemplifies this, for, by comparing them with the cultural characters of other pathogenic species, a fairly shrewd guess at its classification may be made by this means alone. For the purpose of this comparison a compilation of the cultural characters of *T. lewisi*, *T. brucei*, and *T. evansi* has been made from the writings of Novy, MacNeal, and Smedley.

It may be mentioned here that attempts have been made in this laboratory to cultivate these three species. The cultivation of the first was found to be a comparatively easy matter; but all attempts, and they were many, to cultivate the last two have, up to the present, failed, although Novy's instructions were carefully followed.

#### *Cultivation Medium used.*

The blood-agar medium used was made according to instructions kindly sent by Professor Novy. These need not be repeated here, as the details are fully given by Novy and MacNeal in various papers.

#### CULTURAL CHARACTERS OF *T. LEWISI*.

##### (A) *Living, unstained.*

*Size.*—Varies considerably in size. Some are not more than 1 or 2 microns long, not including the flagellum. Others are about the diameter of a red blood corpuscle, while the usual length of the spindle-shaped cells is 15 to 20 microns. Some trypanosomes can be found at times which are 50 to 60 microns long. The greatest variation in size is found in young cultures.

*Shape.*—*T. lewisi* varies greatly in shape, as well as in size. Round, pear-shaped, fusiform and slender forms are present in the cultures. The round forms are usually found in old cultures, and are probably involution forms.

*Contents of Cell.*—The protoplasm in *T. lewisi*, especially in young cultures, is bright, glistening, and apparently homogeneous in structure in the fusiform and slender forms.

*Undulating Membrane.*—Not present as far as can be seen. The movement of these cultural forms appears to be entirely due to the rapid motion of the flagellum.

*Flagellum.*—These forms possess, as a rule, a long free flagellum. In the slender forms this is sometimes twice the length of the body.

*Motion.*—The single, slender, cultural forms of *T. lewisi* are very active, and dart across the field of the microscope in a straight line. In older cultures the round and other involution forms do not, as a rule, show more than a slight swaying movement.

*Colonies or Aggregations.*—Growth commences in a first generation about the fifth day by the appearance of small rosettes composed of a few trypanosomes. The colonies rapidly grow, so that on the following day masses of wriggling trypanosomes may be seen. These aggregations of twenty or more are attached by their flagella. They grow larger and larger until, about the twenty-fourth day, they are apparent to the naked eye, and consist of many thousands of trypanosomes.

(B) *Fixed, Stained.*

*Protoplasm.*—Homogeneous, as a rule. Vacuolation is rare, but sometimes a large highly refractile vacuole is seen.

*Nucleus.*—Round or oval in shape. Situated centrally or at the junction of the anterior and middle thirds.

*Micro-nucleus.*—Is placed either close to the nucleus or at a variable distance anterior to it. In the free forms it is never seen lying posterior to the nucleus. As a rule, it is a rod-shaped structure, lying transversely to the long axis of the trypanosome.

*Flagellum.*—Arises from the vicinity of the micro-nucleus. The free flagellum is often two, three, or four times the length of the body of the trypanosome.

*Undulating Membrane.*—In the cultural form of *T. lewisi* this structure is apparently absent.

*Colonies or Aggregations.*—There is little to add to the description of the trypanosomes and of their arrangement in colonies. Stained preparations show that the trypanosomes sometimes possess very long flagella. Novy and MacNeal<sup>1</sup> have not apparently succeeded in staining the flagellum in their preparations, though they noted the position of the centrosome. They expressed the opinion that the end of the trypanosome pointing towards the periphery of the colony was the anterior extremity, and that from it a flagellum would arise if the cultural conditions were perfected (Smedley).

*Measurements of the Cultural Forms of T. lewisi.*

*Pear-shaped Forms.*—(1) Body, 3·6 to 4·4 microns long, and nearly as broad. (2) Flagellum, two to four times the length of the body.

*Spindle-shaped Forms.*—14 to 16 × 2·4 to 3·5 microns, flagellum not included.

Smaller and larger forms are frequently found.

The adult parasitic form of *T. lewisi* measures 24 to 25 × 1·5 microns (Laveran and Mesnil) (Smedley).

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<sup>1</sup> "Cultivation of *Trypanosoma brucei*," p. 28.

CULTURAL CHARACTERS OF *T. BRUCEI*.(A) *Living, unstained.*

*Size.*—Shows less variation in size than *T. lewisi*, and averages 15 microns in the living condition. Smaller than those found in the blood.

*Shape.*—Does not vary much in shape, and closely resembles the forms found in the blood (Smedley).

*Contents of Cell.*—Show one or two very large, bright, and highly refracting globules, usually placed near the anterior or flagellar end, in the otherwise homogeneous colourless cell. In size the globules may attain 1 micron. At times the number of these globules is increased, as when the culture is kept at 34° C. The presence of numerous large, highly refractile globules in the cultural forms of *T. brucei* is attributed by Novy and MacNeal to degeneration of the organisms, owing to imperfection of the culture medium. These globules become more numerous as the age of the culture advances. Do not seem to alter in position or shape if kept under observation for several hours. Resist staining completely. Laveran and Mesnil suggest that the globules are of the same nature as the refringent, unstainable granules found in *T. rotatorium*.

*Undulating Membrane.*—No detailed description available.

*Flagellum.*—The flagellum in the living cell is by no means as distinct and as long as that of *T. lewisi*.

*Motion.*—The motion of *T. brucei* is slow and wriggling, and only exceptionally is a slowly progressive form observed. The wave-motion slowly passes along the thick, undulating membrane, and gives the appearance of a spiral rotation to the entire cell. Scarcely departs from its place (Novy). In a young culture the trypanosomes are found to possess very active movements. Sometimes they advance across the field moderately quickly, but their rate of movement is always much slower than that of the rat trypanosomes, whose flagella are longer and more rapid in motion (Smedley).

*Colonies or Aggregates.*—Occur in groups or rosettes. Rarely form masses of more than ten to twenty cells. The individuals are long, narrow, and show the peculiar writhing motion. The flagella are directed outwards, and the appearance of the whole may be compared to the snakes on a Medusa head. The stellate group, with the bright, refracting globules within the cells, suggests a jeweller's "sun burst" (Novy). The active movements of the trypanosomes, and the large glistening vacuoles with which they are studded, give these colonies a singularly beautiful appearance (Smedley).

(B) *Fixed, stained.*

*Protoplasm*.—The protoplasm invariably contains a few deeply stained granules of a red or violet colour. The vacuoles are seen as clear circular spaces with sharply defined outlines in stained preparations (Smedley).

*Nucleus*.—Round or oval in shape, and in older forms it breaks into masses of chromatin, which are found distributed through the protoplasm of the cell (Smedley).

*Micro-nucleus*.—This is much smaller than in *T. lewisi*; it is usually circular, but sometimes elongated. It stains a deep red or purple colour, and it is sometimes difficult to distinguish it from the other granules. It is generally found close to the vacuole; sometimes it lies close to the nucleus, but it is nearly always posterior to the latter structure (Smedley).

*Flagellum*.—Takes a tortuous course along the free border of the undulating membrane, and projects for a short distance from the anterior extremity (Smedley).

*Undulating Membrane*.—No detailed description given.

*Colonies or Aggregates*.—Most of the flagella are directed in an outward direction. It is rare to find colonies of a large size (Smedley).

*Measurements of the Cultural Forms of T. brucei.*

Length, including flagellum, 18 to 23  $\times$  2.5 to 3.5 microns. Length of free flagellum, 3 to 5 microns. Diameter of vacuoles, 1 to 2 microns. The adult parasitic forms of *T. brucei* measure, in the blood of rats, 26 to 27  $\times$  1.5 to 2.5 microns (Laveran and Mesnil) (Smedley).

CULTURAL CHARACTERS OF *T. EVANSI*.

(A) *Living, unstained.*

*Size*.—The body of one large individual measured 21 microns, while the flagellum was 28 microns in length.

*Shape*.—The slender fusiform body terminates at one end in a delicate flagellum. The posterior end, especially when blunt, showed a rod-like tip or stylet, which varied from 2 to 4 or even 6 microns in length. As the cultures aged, pear-shaped or spherical, highly granular, involution forms appeared. In the former type, measuring about 3 by 5 microns, the end was often provided with a flagellum, 10 to 15 microns long, which still showed a slow lashing movement, though the cell itself was motionless. The spherical forms varied from 3 to 9 microns in diameter, were granular, and often showed a remnant of the flagellum as a short, stiff, motionless

whip. These involution forms, as in the case of *T. lewisi* and *T. brucei*, eventually gathered into large groups or masses, which at times filled the field of an immersion lens. Later on, the round bodies broke up into masses of very minute granules.

*Contents of Cell.*—Presence and peculiar arrangement of granules within the cells, and a distinct yellowish or greenish colour of the granules and of the contents. Large numbers of small granules or globules, which vary from 0.3 to 0.5 micron in diameter. These globules, as well as the contents of the cell, possess a decided yellowish or greenish colour, and appearance quite unlike that of either *T. lewisi* or *T. brucei*. The globules are usually massed in the anterior third of the cells—that is, at the base of the flagellum, and only a few isolated granules are scattered through the remainder of the organism (Novy and MacNeal).

*Undulating Membrane.*—Is not recognisable in the living organism.

*Flagellum.*—Usually as long and often even longer than the cell itself.

*Motion.*—All single and actively motile, traversing the field of the microscope at great speed. Travel with the flagellum in rear or in front.

*Colonies or Aggregates.*—Entire absence of the groups or rosettes, which are so characteristic of the cultures of *T. lewisi* and *T. brucei*. The trypanosomes were all single and actively motile.

#### *Measurement of the Cultural Forms.*

Length, including flagellum, 25 to 50  $\times$  1.5 to 2.5 microns.

#### CULTURAL CHARACTERS OF DR. EDINGTON'S TRYPANOSOME.

##### (A) *Living, unstained.*

No difficulty is found in cultivating Dr. Edington's trypanosome. As early as the second day, if kept at 25° C., it is found to have greatly increased in numbers. The single individuals are in active motion, the flagellum widely waving, while the body slowly moves among the corpuscles. Many dividing forms are seen with two or three flagella. Masses or aggregations are also seen varying in size, from those composed of a dozen individuals to those occupying a fifth of the field. These aggregation-forms are all writhing and squirming, while the flagella at the periphery are frantically waving. This incessantly moving mass, dotted over as it is with many small light vacuoles, makes a curious and beautiful microscopic object when brightly illuminated.

On the third day the trypanosomes have multiplied to an extra-

ordinary extent. Huge aggregations are now seen, each filling up several fields of the microscope. The individual trypanosomes are still actively motile. Single, double, and small aggregations are also seen.

By the seventh day they have reached the height of their growth and begin to degenerate.

After the twelfth day the living forms can no longer be recognised in the culture tubes.

*Size.*—Dr. Edington's trypanosome, examined in the fresh living condition, varies considerably in size. Some of the large forms measure 32 microns in length, whereas the smaller are only half that length, or even shorter.

*Shape.*—So also in regard to shape, these cultural forms vary extremely. Round, oval, pear-shaped, and irregular forms are seen. Slender forms shaped like ordinary trypanosomes, with a beak or rostellum at one end, a fairly thick flagellum at the other, and furnished with an undulating membrane, are fairly common. Large irregular masses of any shape, furnished with one or more flagella, are also frequent.

*Contents of Cell.*—These cells have a remarkable appearance, as they are filled with highly refractile granules, large in size, round in shape, and numerous.

*Undulating Membrane.*—The round, oval, and pear-shaped forms do not appear to possess an undulating membrane, whereas the long, slender forms, as also the huge fish-shaped or octopus-like forms, often show well-marked undulating membranes.

*Flagellum.*—The flagella in these living unstained cultural forms are thick and coarse, and differ markedly from the slender structures usually associated in the mind with trypanosomes. Just as in the parasitic forms found in the blood, it is evident that the protoplasm of the body extends to the tip of the flagellum giving rise to this thick stumpy appearance.

*Motion.*—The slender forms are active and swim fairly quickly across the field. The large, irregular forms are stationary, but exhibit actively wriggling flagella and amoeboid movements of the body substance.

*Colonies or Aggregates.*—Colonies or aggregations of ten to twenty individual cells are common. The cells are arranged irregularly. Some of their flagella may be directed outwards, while others are seen entangled in the mass and feebly wriggling. On the third day these aggregations may be seen as large as three to five fields of the microscope, and must be composed of many thousands of individual trypanosomes.



*(B) Fixed, stained.*

*Method of Fixing and Staining.*—The cultural forms of Dr. Edington's trypanosome were either prepared by mixing a drop of the cultivation fluid with fresh serum, spreading on a slide, and staining by Leishman's modification of Romanowsky's method, or the fluid was spread on a slide, fixed by osmic acid and stained by Giemsa, and then treated with orange tannin to differentiate the various structures.

In Leishman-stained preparations the protoplasm of the cell is stained a pale blue, the nuclei and irregular masses of chromatin reddish or pink, while the vacuoles stand out as unstained spaces with sharply defined margins. In Giemsa-stained preparations, on the other hand, the protoplasm is stained a pale puce colour, while the chromatin material is stained reddish purple.

*Protoplasm.*—The protoplasm of the cell is homogeneous, but contains irregular-shaped granules and masses of chromatin-staining material. There are also present numerous well-marked vacuoles of various sizes, which are unstained, and, as mentioned above, highly refractile.

*Nucleus.*—The nuclei are of every form and shape, and often broken up into irregular masses.

*Micro-nucleus.*—The micro-nuclei are irregularly placed; in some cells are not easily distinguishable from other granules contained in the protoplasm, but in many are clearly seen as deeply staining bodies, round or rod-shaped, in close connection with the point of origin of the flagella.

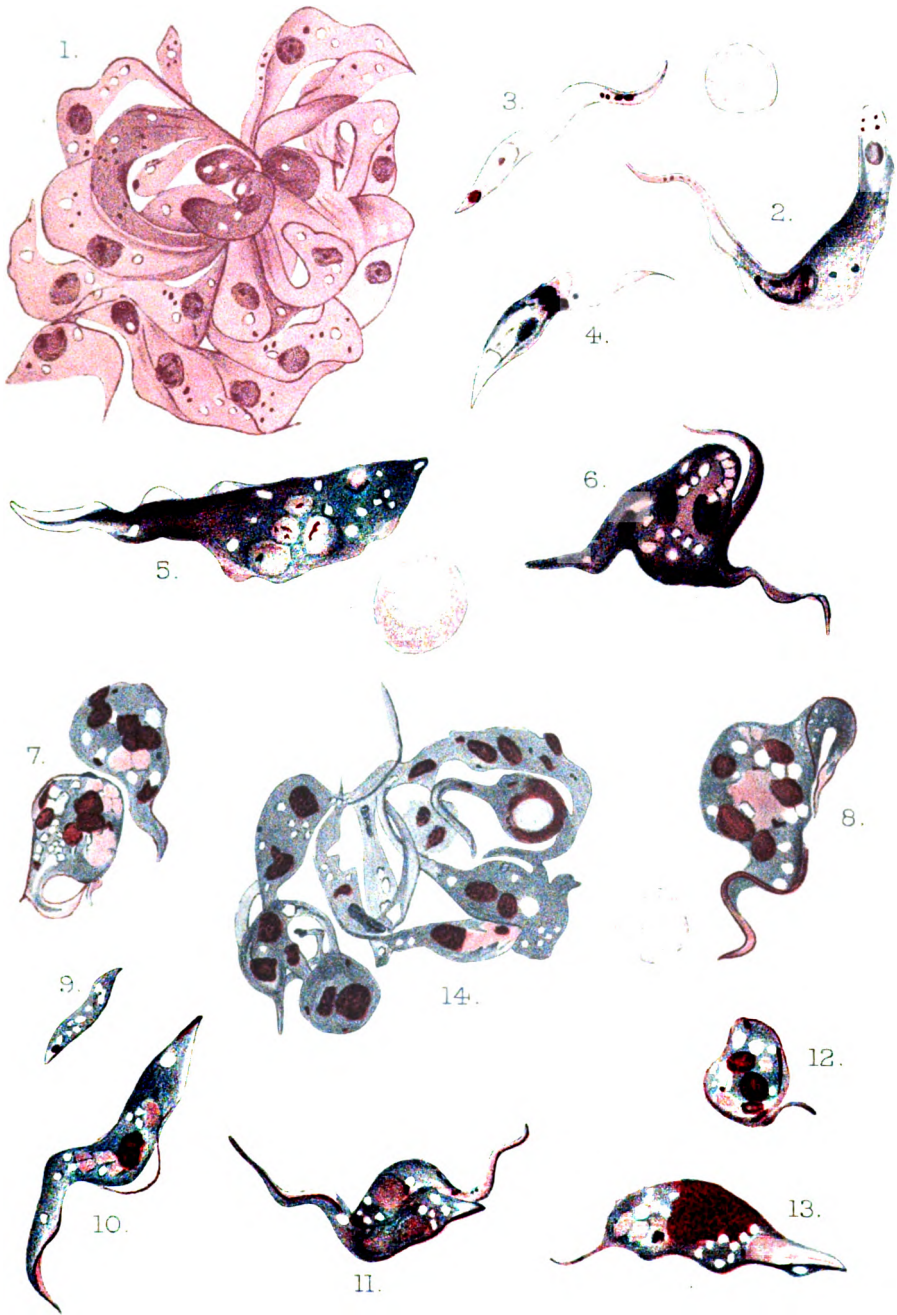
*Flagellum.*—The flagella are, as a rule, thick and fleshy. In the irregular forms they appear to spring from any part of the shapeless mass of protoplasm, and in any direction.

*Undulating Membrane.*—The undulating membrane is also characterised by its extreme irregularity. In many cells it appears to be absent, while in others it is well marked, broad, and thrown into folds.

*Colonies or Aggregations.*—The individual trypanosomes which go to compose the large aggregations are as a rule short and stumpy in form, with oval-shaped nucleus and short stumpy flagellum. They are of irregular shape and size, and are placed without any seeming order.

#### CULTURAL CHARACTERS OF *T. DIMORPHON* (DUTTON AND TODD).

It is unnecessary to describe in detail the cultural characters of this trypanosome, as they agree exactly with those of Dr. Edington's.



Bale & Danielsson, L<sup>td</sup> lith.

To illustrate paper  
"A TRYPANOSOME FROM ZANZIBAR."



CULTURAL CHARACTERS OF *T. CONGOLENSE* (BRODEN).

Several attempts were made to cultivate *T. congolense*, but none of them were very successful. There is certainly not the rapid growth of this trypanosome which distinguishes Dr. Edington's trypanosome and *T. dimorphon*. It is only after a long search that individual trypanosomes can be found in the preparations. There is no formation of masses or aggregations filling several fields of the microscope as in the others. It is difficult to say whether there is any real multiplication or not. All that can be said is that, for about eight days, living trypanosomes can be seen. At first these are shaped like the ordinary trypanosomes found in the blood, only larger and swollen in appearance; but by the fifth and following days these change into most irregular and fantastic shapes. Nothing living could be seen after the eighth day. This cultivation experiment would therefore seem to strengthen Dr. Laveran's opinion that *T. dimorphon* and *T. congolense* are distinct species.

*Conclusion.*

The conclusion arrived at is that Dr. Edington's trypanosome from Zanzibar is probably Dutton and Todd's *T. dimorphon*. One link in the chain of evidence, however, is wanting, and that an important one—the identity or non-identity of the carrier.

DESCRIPTION OF PLATES.

PLATE 1.

This plate represents the shape and size of the three trypanosomes, viz. :—

- (1) Dr. Edington's trypanosome. From blood of rat. 30th day of disease. Stained Giemsa.  $\times 2,000$ . See p. 14.
- (2) *T. dimorphon*. From blood of rat. 15th day of disease. Stained Giemsa.  $\times 2,000$ . See p. 16.
- (3) *T. congolense*. From blood of mouse. 7th day of disease. Stained Giemsa.  $\times 2,000$ . See p. 17.

PLATE 2.

FIG. 1.—Part of an aggregation of Dr. Edington's trypanosomes after 5 days' growth. Stained Giemsa.  $\times 2,000$ .

FIGS. 2-4.—Dr. Edington's trypanosome after 6 days' growth. Stained Giemsa.  $\times 2,000$ .

FIGS. 5-14.—Cultural forms of Dr. Edington's trypanosome after 7 days' growth. Stained Leishman.  $\times 2,000$ .

## FURTHER NOTES ON FEVERS IN MALTA.

BY LIEUTENANT-COLONEL J. J. GERRARD.

*Royal Army Medical Corps.*

IN the Journal for November, 1907, I published some notes on "simple continued fever" as seen in Malta. Since then I have had continued opportunities of observing cases of this disease and I have noted some further points which I think may be of interest.

*Incidence.*—Taking the subject of incidence first, I may recall the fact that in my former paper I expressed the opinion that the incidence was affected by the proximity of the barracks to the seashore and the consequent increased temptation to stay too long in the water or to sit about after bathing. I drew the inference from the following table :—

1906	{	1st Rifle Brigade ..	St. Andrew's Barracks	21 cases	9 months
		4th Rifle Brigade ..	St. George's Barracks	*76 cases	12 months
		R.G.A. (3 double Co.'s)	Tigne Barracks ..	59 cases	7 months

\* This should have been 80.

St. Andrew's Barracks are quite new and lie about half a mile from the seashore and about 200 feet above the sea-level.

St. George's Barracks are on the side of St. George's Bay, Tigne Barracks are also practically on the sea-level at Tigne Point.

The difference in favour of St. Andrew's Barracks in the above table is very marked.

The 4th Rifle Brigade, however, had lately come out to the island, while the 1st Rifle Brigade have been here three years, so it struck me that perhaps the incidence might be affected by length of time in the island. I was unable to work this out in the case of the 1st Rifle Brigade who had gone away, but I went through some "admission and discharge" books for former years, taken at random, and made out the following table from the 734 consecutive cases :—

ADMISSIONS FOR SIMPLE CONTINUED FEVER SHOWN ACCORDING TO THEIR  
YEARS OF SERVICE IN MALTA.

Total	During their 1st year	During their 2nd year	During their 3rd year
734	453	174	88
Percentage	61·7	23·7	12·0

There were nineteen admissions of men in their fourth year and onwards.

This shows that the vast majority of cases admitted into hospital are men in their first year of service in Malta. It is evident, however, that to be of any value such a table should show the number of men serving in Malta in each of these periods. It was not possible to work this out for the cases shown in the table, but the 4th Rifle Brigade, which has just left the island, appeared to be a suitable example to work on, and so the following table was prepared.

The strengths have been arrived at by adding and subtracting the strengths of the drafts joining and leaving the battalion as shown in general orders.

TABLE SHOWING ADMISSIONS TO HOSPITAL FOR SIMPLE CONTINUED FEVER, OR PYREXIA OF UNCERTAIN ORIGIN, AMONG MEN OF FOURTH RIFLE BRIGADE.

STRENGTH				ADMISSIONS			
YEARS IN MALTA				YEARS IN MALTA			
		Under 1	Under 2	Under 3	Under 1	Under 2	Under 3
1906	..	762	..	..	80	..	..
1907	..	476	388	..	70	49	..
1908	..	259	470	67	6	2	9
Percentage of admissions among men in their 1st year .. 10·4							
" " " " " 2nd " .. 12·6							
" " " " " 3rd " .. 13·4							
In 1906 the battalion occupied St. George's Barracks.							
" 1907 " " Floriana and Manoel Barracks.							
" 1908 " " St. Andrew's Barracks.							

This table took a certain amount of working out and was rather disappointing when finished. One would hardly have expected the movements to and fro of such large drafts. The high admission-rate in 1907 complicates matters also. The battalion was stationed in another part of the island during that year and was split up between two barracks, and so I am afraid I cannot throw any light on its causation.

The number of men in their third year in Malta in 1908 is too small to justify any conclusions being drawn from that year.

It would appear, however, from this table, that the admissions for these fevers is less among men in their second year in Malta than in their first. This is what one would expect, as men in their first year abroad are inexperienced and have not learnt the necessity

of changing or modifying their home habits to suit the climate. Moreover, the young soldier is more likely to come into hospital when he gets an attack of fever than a man of longer service who has suffered before. The latter is inclined to make light of it or to lie up in his barrack-room. The actual incidence of these diseases is on that account a much more difficult matter to make out.

The most remarkable fact that appears from this table is the extraordinary drop in the figures for 1908, the admission-rate being :—

1906	..	..	..	..	10.5 per cent.
1907	..	..	..	..	13.7 „
1908	..	..	..	..	2.1 „

In 1908 the whole battalion was together living amid the same surroundings and under identical conditions. The percentages of admissions in that year were :—

Men in their 1st year in Malta	..	..	2.3 per cent.
„ 2nd „	..	..	0.4 „

which bears out the conclusion that the incidence is greater in the first year of service in Malta than in the second.

In 1908 the 4th Battalion Rifle Brigade were in St. Andrew's Barracks, and it will be noticed that the total admissions—seventeen—are in keeping with the admissions for the 1st Battalion of the same regiment—twenty-one—when quartered in these barracks in 1906.

Having concluded, therefore, that the age incidence is in favour of men in their second year of service in the island, it is now necessary to consider the difference in the incidence between the two barracks, St. Andrew's and St. George's :—

TABLE SHOWING ADMISSIONS FOR SIMPLE CONTINUED FEVER FROM  
ST. GEORGE'S AND ST. ANDREW'S BARRACKS.  
*St. George's.* *St. Andrew's.*

Year	Admissions	Year	Admissions
1904	82	1905	31
1905	86	1906	23
1906	80	1907	22
		1908	17

During the three years shown in the table St. George's Barracks were occupied by a battalion. Since then they have been used as a musketry depôt, and have been occupied for short periods at a time by detachments of the different corps in the island. So it is better, I think, to confine our enquiry to years when the barracks were in occupation by a complete unit.

St. Andrew's were not occupied before 1905.

Both St. George's and St. Andrew's are good barracks ; they are well out in the country and away from towns and villages. St. Andrew's are new, and have only been occupied since April, 1905. The company blocks are two-storied, with four rooms on each floor. St. George's are much older barracks. They are on the western side of St. George's Bay, and practically on the seashore. The company blocks are single-storied with two exceptions (G and H).

Both barracks are infested with sand-flies, but mosquitoes are not so abundant in St. Andrew's as in St. George's. The rocky coast round the latter is honeycombed by the sea and the holes are filled with salt water in which the *Acartomyia zammitii* mosquito breeds in myriads. These mosquitoes are plentiful in the barrack-rooms in St. George's, while few find their way so far inland as St. Andrew's. There, the only ones found are *Culex pipiens*, *C. fatigans*, and *C. spathipalpis*, with occasionally *Stegomyia* and *Acartomyia*.

St. George's Bay is the common bathing-place for both barracks during the summer. The men in St. George's are likely to bathe more, and being so near their own barracks are more likely to sit about afterwards. The men from St. Andrew's have about half a mile walk uphill—an ascent of about 200 feet—to get back to barracks. This distance is not very great, but it is far enough to make a difference between loafing about and getting chilled, and taking exercise enough to promote reaction of the skin.

I have prepared two spot maps to show the barrack-rooms from which the cases were admitted ; the figures are the months in which the cases occurred.

Taking that for St. George's first.

C block was unoccupied during the period ; D block only contains six rooms ; G and H are double-storied blocks of six rooms each, three on each floor.

(a) It will be noticed that, on the whole, the cases have been very evenly divided among the different rooms.

(b) There appear to have been "explosions" of disease in certain rooms.

(c) In no instance have these explosive outbreaks taken place in the same room two years running.

(d) There were five rooms from which three cases were admitted two years running, viz., A 1 and 2, H 3 and 5, F 7, though not in corresponding months, and from no room were more than three cases admitted during any two years of the series.



SPOT MAP. ST. GEORGE'S BARRACKS.

1904 = . 1905 = . 1906 = numerals only.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
A	.7 .42	.7 .89	.9 .7	.1	.7	.9	.7 .10 .57	.8 .9	6	.7 .96 .9	6 .11 .8	.7 .56	.7 .67	.79	
	.8 .66	.7 .8	.7 .9	.14 .			.9			.8 10	6 7				
	.7 .6	.7 .10	.7 .9												
B	.7 .86	.7 .7	.7 .6	.7 .9 10	.7 .6	.9	.7	.8 .66		.8	.7 .10	7 10		.9 .10	
	.7 .7	.7 .7	.7 .8	.7 .7			.8 .9								
H	6	.7 .3	.7 .2	.7 .56	.7 .68	.8 .9									
		.8 .7	.7 .6	.107	.9 .8										
		.9	.7 .7	.11 .9											
D			.8 .7	.3 .8		.11 .9									
			.11												
E	.10 .3		.3 .77	.8	7 7 7	.11		.9	.7		.7 .7	.9 .10	7	.7 .6	
	.3 .7		.9 .9								.8 .8	.10			
F	.7		.76	.7 .69	.9	.8 .69	.7 .6	.8 .3	.7 .6	.77	.8 .86	.5	.7 .66	.8 .4	
			.7 .8			.7 .10 .8 .79	.8 .79	.3 .6	.7 .8	7 7	.8 7	.6	.7 .97	.8 .8	
			.9			.10 .11 .8		.6 .9	.9		.8 .8	.6			
G	.410	.9 .87	6	.8 .67	.6 6										
		.7		.7											

(e) The explosive outbreaks do not point to any permanent cause in the particular room in which they occurred, as they are followed by a greatly diminished number of cases the following year.

1904	1905	1906
<b>A 2 Room</b> (4 admissions in July)— 1 on 2.7.04 .. 3 days in hospital. 2 „ 19.7.04 .. 3 and 1 days in hospital. 1 „ 22.7.04 .. 8 days in hospital. <b>A 13 Room</b> — 1 on 18.7.04 .. 8 days in hospital. 1 „ 23.7.04 .. 10 days in hospital. <b>B 1 Room</b> — 3 cases on 5.7.04. Each 4 days in hospital. A case of Mediterranean fever admitted same day from this room. <b>H Block.</b> Double-storied— $\frac{4}{1} \frac{5}{2} \frac{6}{3}$ rooms. <i>H<sub>1</sub></i> — 1 on 29.7.04. <i>H<sub>2</sub></i> — 1 on 11.7.04. 1 „ 21.7.04. 1 „ 26.7.04. 1 „ 15.8.04. 1 „ 5.9.04. 1 „ 8.9.04. 1 „ 26.9.04. <i>H<sub>3</sub></i> — 1 on 8.7.04. <i>H<sub>4</sub></i> — 1 on 8.7.04. 1 „ 6.9.04. 1 „ 2.11.04.	<b>A 1 Room</b> — 2 cases on 11.6.05. A case of Mediterranean fever admitted from this room on 6.6.05. <b>F 8 Room</b> — 1 case on 29.6.05. 1 „ 30.6.05. One case Mediterranean fever from this room on 26.6.05. <b>F 11 Room</b> — 1 on 4.8.05. 1 „ 25.8.05. 1 „ 26.8.05. 2 „ 28.8.05. 1 „ 29.8.05. A case of Mediterranean fever from this room on 25.8.05.	<b>A 11 Room</b> — 1 case, 11.6.06. 1 „ 27.6.06. <b>E 3 Room</b> — 1 case, 17.9.06. 1 „ 19.9.06. <b>E 4 Room</b> — 1 case, 7.7.06. 1 „ 26.7.06. 1 „ 30.7.06. <b>F 6 Room</b> — 1 case, 17.10.06. 1 „ 27.10.06. <b>F 10 Room</b> — 1 case, 9.7.06. 1 „ 10.7.06. 1 „ 14.7.06. <b>F 11 Room</b> — 1 case, 20.6.06. 1 „ 21.6.06. <b>G 2 Room</b> — 1 case, 1.7.06. 1 „ 3.7.06.

The statement above shows the dates of admission in the more interesting groups. In some instances the dates seem to bear a certain relationship to one another; a second and third case occurring after a definite interval, three to four days. Instances of this are:—

1904	A 2	19.7 and 22.7
	A 13	18.7 „ 23.7
	H 3	5.9 „ 8.9
1906	E 3	17.9 „ 19.9
	E 4	26.7 „ 30.7
	F 10	9.7—10.7—14.7

Another point of interest which came to light in tracing the dates of admission is the relationship some of the outbreaks bear to cases of Mediterranean fever, *e.g.*: Of four men admitted from B 1 on July 5th, 1904, one proved to be a case of Mediterranean

fever. A case of Mediterranean fever admitted June 6th, 1905, from A 1 was followed by two cases of simple continued fever on the 11th. One case of Mediterranean fever admitted June 26th, 1905, from F 8 was followed by two cases of simple continued fever on the 29th and 30th respectively. A case of Mediterranean fever admitted August 25th, 1905, from F 11 was one of two fever cases on that day, and was followed by cases on 26th, 28th (two), and 29th.

The outbreak in H block in 1904 is interesting—the cases in the upper storey being followed by cases in rooms below after a three to four day interval, and *vice versa*. Cases in one room (July 26th) were followed by a case in the next room (July 29th).

SPOT MAP. ST. ANDREW'S BARRACKS.

1905 = .    1906 = \*    1908 = °

	1	2	3	4	5	6	7	8	9
A {	.6 .5 .7	.7		.6 .8	.5		.6		
B {	.8	.6		.6	.9	.6 .7			
C {	.10 .3	.8	.3		.6	.6	.1		
D {	.6	.12	.6	.7	.7 .7		.7 .6	.6	
E {			.7	.8	.8	.7 .10	.6 .6		
F {		.7		.7			.5	.6	
G {			.11 .7	.7	.6 .3		.5 .4 .7	.4	
H {	.4 .9			.8 .7	.7		.4	.6 .7	
J {		.12			.7	.5	.6 .8	.7 .8	

*St. Andrew's.*

The spot map for these barracks for the three years 1905, 1906, and 1907, does not call for any remarks. All the cases appear to have been separate ones. Two cases from E 7 in June, 1904—16th and 19th—is the only instance of two cases arising in the same room in the same month.

MONTHLY INCIDENCE.  
St. George's.

	1	2	3	4	5	6	7	8	9	10	11	12
1904 ..	1	1	2	0	0	0	30	22	15	4	7	0
1905 ..	0	1	6	3	4	18	21	18	12	3	0	0
1906 ..	0	1	0	0	0	19	27	2	11	6	0	0

St. Andrew's.

	1	2	3	4	5	6	7	8	9	10	11	12
1905 ..	..	..	..	..	1	13	8	6	1	2	0	0
1906 ..	0	0	0	1	2	3	8	3	2	0	1	1
1908 ..	1	0	3	3	2	1	4	1	0	0	0	2

It seems permissible to draw certain conclusions from the foregoing—with the proviso that as the figures only relate to two barracks in a particular district of the island (Pembroke) the conclusions are applicable to that district only.

(1) That the incidence of the fevers of uncertain origin is greater in the first year of service in Malta than in the second.

(2) That the men in St. George's Barracks suffer much more from these fevers than those in St. Andrew's.

(3) That the majority of cases are sporadic ones.

(4) That in several instances a second case has followed a first in the same room after a period of days (three to four), which appears to be constant.

(5) That this seems to point to the transmission of infection and to the incubation period of the disease being three to four days.

(6) That there are other instances of cases following a previous one at this regular interval, but not in the same room, and that the fact of their being in the next room, or in rooms of another storey of the same block, would support the theory of the infection being carried by a winged insect.

(7) That the months of greatest prevalence are June, July, August and September.

(8) That the outbreak, beginning suddenly in June, reaches its height in July, gradually subsides in August and September, and drops suddenly in October.

## PART II.

### TYPES OF FEVERS MET WITH UNDER THE HEADING "PYREXIA OF UNCERTAIN ORIGIN."

Under this heading I hope to show that there are included three forms or types of fever, viz., a "three-day," a "seven-day," and a "ten-day."

*"Three-day" Fever.*

I have little to add to my previous remarks on this subject. It is by far the commonest form met with, accounting for from 75 to 85 per cent. of the admissions for pyrexia of uncertain origin. It has come into increased scientific prominence lately from the investigations and experiments of Doerr.

The three-day fever he studied appears to resemble that seen in Malta, at least so far as I can gather from Lieutenant-Colonel Birt's most interesting and stimulating article in the Journal for last December. Probably it is the same, as even in my own experience it is a very widespread disease. It was very common in the Punjab when I served there, and no doubt is still. It was also common in the Transvaal (Standerton), and I have also seen it in Natal. The question of its identity with dengue has been raised; I have never seen a case which could be mistaken for that disease, though possibly in an epidemic of dengue some cases might be so mild as to be mistaken for "three-day" fever.

The backache in "three-day" fever is sometimes rather severe, but neither the backache nor the pains in the bones are ever of the excruciating "break-bone" character seen in dengue. Moreover, they are transient and do not persist as in that disease. As a rule I have found them subside as soon as the calomel and diaphoretics have begun to act, and during the second and third days the patient suffers very little.

I have continued to observe the solitary rose-spot occasionally in the neighbourhood of the umbilicus. It resembles an enteric spot on its first appearance, but differs in that on the second day it becomes a tiny pustule and dries up on the third day. Many cases of this form of fever do not report sick at all. This is particularly the case among the older soldiers, who make light of a "touch of fever" as they call it. In the hot weather their work is generally light and they prefer to lie up in their barrack-rooms to going to hospital. This possibly may account for some of the apparent greater prevalence among men in their first year abroad; to them fever of this kind is a novelty and is taken more seriously than by their more experienced comrades. This delay in reporting sick adds to the difficulty in calculating the duration of the fever.

In my former paper I divided the "fevers of uncertain origin" seen here into two classes: (1) the "three-day" fever; (2) those in which the temperature is raised for more than five days; the fever usually lasting six or seven days. Of the latter I was able to

recognise two types, one of which resembled enteric in the appearance of the patient and the course of the temperature ; and a second in which the symptoms were much milder and more quickly recovered from and which seemed a sort of transition type. These two I now describe as distinct diseases, the former being the "ten-day" and the latter the "seven-day" fever. My difficulty in classifying them more accurately at the time arose from the varied duration of the fevers when in hospital. Some men had a temperature for four days, some for eight, others for six or seven. Since then, however, I have read Major Rogers' very interesting book on fevers in India, and have been greatly struck by the article on "seven-day" fever. He, too, felt the difficulty arising from patients being admitted at different stages of the disease, but with great acumen he recognised the peculiar course of the temperature, and which from its appearance on the chart he has called the "saddle-back" temperature.

On going through my temperature charts again I had no difficulty in recognising this peculiarity in a great many of them. Indeed, there were twotypical examples among those given in my former article, and several others which exhibit some of the modification to which Major Rogers has drawn attention.

It is consequently evident that there is a "seven-day" fever prevalent in Malta which is identical with that met with in Calcutta.

#### *"Seven-day" Fever.*

This form of fever is much less common than the "three-day." It differs from it in its onset, being more gradual, patients usually giving a history of having felt unwell for two or three days. They usually complain of headache and backache on admission, the headache being the more prominent symptom.

The pulse is slow ; the tongue is furred, but tends to clean at the tip and edges. Abdominal distension is uncommon ; constipation is the rule ; indeed, I have never seen diarrhoea in these cases. Rose-spots are generally present, but as a rule they appear one at a time. Sometimes none are to be found, in other cases only one ; in others three or four come out, appearing one by one on different and not always successive days. I have seen a rose-spot appear after the temperature has fallen to normal (I have seen this happen, too, in a case of enteric fever). It is noticeable that in most of these cases of "seven-day" fever the patients suffer very little after the first day or two. They get a headache when the temperature

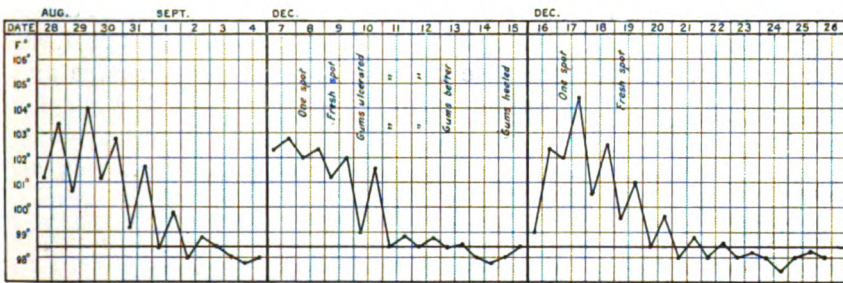


appearance is the same as in the "seven-day" fever. The tongue is covered with a more creamy fur than in any other form of fever and tends to be clean at the tip and edges. The bowels are constipated, the pulse slow, soft and often dicrotic.

Unlike the "three-day" and "seven-day" fevers, no case of this type has occurred among patients already in hospital. Consequently it has not been possible to obtain a complete record of the temperature during an attack. The cases usually come under notice between the third and fifth day and the characteristic of the temperature is the manner in which it steadily "spikes" down to normal.

The evening rise and morning remission occur regularly and are not interrupted by the sudden jump which gives the characteristic

"TEN-DAY" FEVER.



*Laboratory Reports.*

No reaction.  
Typical Enteric facies.  
No spots. No distension.

*Laboratory Reports.*

Enteric, Med. F., P. Typhoid (α). Negative.  
P. Typhoid (β).  $\frac{1}{30}$  Partial.  
 $\frac{1}{100}$   $\frac{1}{100}$  Negative.  
(10th and 14th).  
18th. Bacilluria. Negative. No distension of abdomen.

*Laboratory Reports.*

Negative to Enteric F.  
Negative to P. Typhoid α and β.  
Typical Enteric facies.  
Distension of abdomen (slight).  
Some prominence of abdominal veins.

appearance to the charts of "seven-day" fever. The examples given below show this well. One of the charts printed in the Journal for November, 1907, p. 492 (on the right of the bottom row), is a good example, and so, too, is that marked "May-June" on p. 493.

The "ten-day" fever reported as occurring in Pretoria during the war must have been, I think, something of this type. I have not the reference by me, but my recollection is that it was shown to be enteric fever by Widal's test and blood cultures. I see, too, that Major Statham has published some temperature charts in the Journal of October, 1908, which are practically identical with



those found in this form of fever here. He has isolated the *Bacillus typhosus* from the blood of his cases. Here all efforts to do so have failed, and Widal's test has been negative except in very low dilutions such as 1—10 or 1—20. On one or two occasions a coli-form organism has been isolated from the urine.

The serum reaction is tested in all cases, specimens of the patient's blood being sent to the laboratory for this purpose. Cultures of blood are also made.

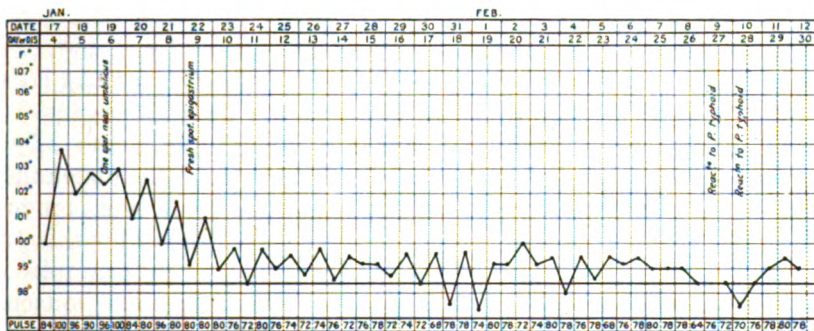
In the "three-day" fever the results have always been negative; in the "seven-day" and "ten-day" forms, although nothing that can be considered positive has been reported, yet the results are not without interest. The laboratory reports are given below with the temperature charts.

A complication noticed in some cases of "ten-day" fever is ulceration of the gums. In one case (Private L.), shown below, this condition existed for the last five days of the fever. It resisted treatment during that time, but quickly healed up as soon as the fever had subsided. In another case the condition was more severe and did not heal up. The temperature fell to normal in the regular manner, but rose again and continued to be of an irregular type for some ten days or a fortnight. During that time there was an evening rise of 90° to 100° and a morning fall to about normal. The gums of both upper and lower jaws were severely ulcerated and the fœtor from the breath was very marked. The patient in spite of this kept on improving in his general condition; his tongue cleaned and his appetite began to return, though any attempt at chewing was impossible owing to the condition of his gums. During the first week that he was in hospital, that is, while the "ten-day" fever was running its normal course, his serum reaction was tested twice and cultures were made from his blood. All were negative. No further tests were made until the end of his third week in hospital, as the slight alteration in his temperature was obviously the result of septic absorption from the gums. Then to my great surprise his serum was reported to give a positive result with *B. paratyphosus* B in a dilution of 1—150. This, of course, necessitated his removal from the select band of ten-day fevers, but I attach his temperature chart.

Where did this man get the paratyphoid bacillus from? He had been in hospital three weeks confined to bed, and he had not got it when he came in. I trust that neither I nor the nurses gave it to him; there were no other cases at the time. Did he grow them in his mouth or elsewhere in his intestinal tract and

inoculate himself? I am inclined to think he must have done so. I was consequently very much interested by an article by Danyz in the *British Medical Journal* for January 23rd, 1907, and by the experiments he quotes and the conclusions he comes to about the *B. paratyphosus* B. In my former paper I expressed my opinion that all these forms of fever were caused by organisms of the intestinal group which have not yet been identified. I think, too, that when they are isolated they will be found to form a regular series, or rather to fill up the gaps in the series between *B. coli* and *B. typhosus*.

## PRIVATE L.



## Laboratory Reports.

- January 18th.—Negative with Enteric and P. Typhoid.  
(Trace with  $\gamma_{10}$  Enteric).  
 „ 24th.—Negative Malta F. and P. Typhoid  $\alpha$  and  $\beta$ .  
 Trace  $\frac{1}{20}$ ,  $\frac{1}{30}$  Enteric. Positive  $\frac{1}{10}$  Enteric.  
 Blood cultures negative.  
 February 10th.—Med. F. Negative.  
 Enteric +  $\frac{1}{10}$  —  $\frac{1}{25}$   $\pm$   $\frac{1}{50}$  —  $\frac{1}{100}$ .  
 P. Typhoid  $\beta$  +  $\frac{1}{100}$  +  $\frac{1}{150}$ .  
 „ 12th.—P. Typhoid  $\beta$   $\frac{1}{100}$   $\frac{1}{150}$   $\frac{1}{200}$ .  
 +  $\pm$   $\pm$   
 Enteric  $\frac{1}{20}$  —  $\frac{1}{30}$  —  $\frac{1}{50}$ .  
 +  $\pm$   $\pm$

I think that in the isolation of the causal organism of the three fevers seen here in Malta in such numbers lies the secret of enteric fever. The abdominal symptoms, the curve of the temperature, the rose-spots, the appearance of the patient and the duration of the attacks all seem to me to point unmistakably to their gradual approach as clinical entities to enteric fever.

Consider the duration of the fevers alone. Taking the classical enteric as a twenty-one-day fever and paratyphoids as running a fourteen-day course, we have the very remarkable series of a three,

seven, ten, fourteen, and twenty-one day fevers all with abdominal symptoms of gradually increasing severity. The arithmetical ratios alone would almost convince one of their relationship.

The arithmetical relationship between their atomic weights which led to the discovery of the missing elements was not more convincing than these figures are. Let us hope that the honour of discovering these missing organisms will be the reward of one of our brother officers.

*"Chill," as a Determining Factor.*—It was the fashion some time ago to make light of "a chill" as a determining factor in the production of disease, and to put it forward as such to be a proof of one's ignorance. I am glad to see it has been defended lately by several pathologists of repute, as in my former article I expressed my belief that these fevers are caused by "chill." I take it that a "chill" means a cooling of the surface of the body and consequent determination of blood to the internal organs.

In cold countries this consequent congestion seems to affect the respiratory organs, while abroad in hot countries the abdominal organs are most affected. The diarrhoea with a foul-coated tongue which attacks a newcomer in a hot country, and which is so common at the beginning of the hot weather, is an example of this. There is evidently congestion of the intestinal mucous membrane and the diarrhoea is an effort of Nature to relieve it. If, then, we take the *B. coli* flourishing on a normal mucous membrane, it seems reasonable to suppose that when that mucous membrane becomes congested and when, so to speak, the culture medium is enriched that virulence of the organism will be enhanced. This I believe to be the origin of these fevers. This implies, I know, a belief in the origin *de novo* of enteric fever which was supposed to have been settled once for all by Murchison years ago, but nevertheless I do believe it can originate this way, a belief which appears to be held by many distinguished scientists.

The disease having originated, then the numberless paths of spreading infection come into play.

That there is some such path in the case of the "three-day" and "seven-day" fevers appears likely from the "explosions" in the different rooms shown on the spot map. Whether it will prove to be that local pest the sand-fly or a mosquito or the house-fly has still to be discovered. By whatever path it may be shown in the future that the infection of these fevers is spread I still believe that in the vast majority of cases they are home-made, auto-inoculated, the products of our own mucous membranes.

## MANŒUVRES OF THE 6TH (POONA) DIVISION DURING 1909.

By MAJOR F. J. WADE-BROWN.  
*Royal Army Medical Corps.*

ALTHOUGH exiled from the pleasant associations connected with home service I am glad to be able to say that I have not been severed from the work I have been interested in for such a long time, viz., work in connection with the field organisation of the Medical Department of the Army.

A few days after landing in this country I was informed by the Surgeon-General of the 6th Division that important manœuvres were about to take place, and that I had been appointed Principal Medical Officer of the Field Force.

Such information naturally at first filled me with delight, but when I realised that I was in India and not in England, and should have to become rapidly acquainted with the intricate workings of the medical branch of the Indian Army, my delight was temporarily transformed into anxiety. However, everything turned out much better than I at first anticipated, thanks to the support I received from the officers of the Headquarter Staff and from the officers of the Royal Army Medical Corps and the Indian Medical Service, with whom I had the pleasure of working.

The countries at war represented Great Britain and the civilised state of Khed; this is explained in the "General Idea" which is inserted.

The British Force consisted of the 1st and 2nd and 6th Divisions. The 1st and 2nd were imaginary, the 6th (Poona) Division and Khedite Force being composed as follows:—

### BRITISH FORCE (6TH POONA DIVISION).

1st (Ahmednagar) Brigade: 2nd Battalion Worcestershire Regiment; 73rd Carnatic Infantry; 110th Mahratta Light Infantry; 123rd Outram's Rifles. 2nd (Poona) Brigade: 1st Battalion Lincolnshire Regiment; 1st Battalion Northamptonshire Regiment; 114th Mahratta Light Infantry; 127th Baluchistan Light Infantry. 3rd (Belgaum) Brigade: 2nd Battalion Leicestershire Regiment; 64th Pioneers; 66th Punjabis; 103rd Mahratta Light Infantry. Divisional Troops: Two Companies Mounted Infantry; three Batteries Royal Field Artillery; one Section B, Volunteer Artillery (Poona Company); Howitzer Section (Royal Garrison Artillery,

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Bombay); Mountain Battery (Royal Garrison Artillery, Bombay); three Companies Sappers and Miners; 34th Poona Horse; 107th Pioneers; Poona Volunteer Rifles.

#### KHEDITE FORCE.

*(Representing two brigades and the extra troops.)*

Two Sections Royal Field Artillery (each representing a battery); Wing 1st Battalion Gloucestershire Regiment; 26th Light Cavalry; one Company 3rd Sappers and Miners; 79th Carnatic Infantry; 80th Carnatic Infantry; 109th Infantry.

By the kind permission of Major-General Alderson, commanding the Division, I am allowed to publish the general and special idea and a map of the country; also his most interesting appreciation.

#### GENERAL IDEA.

*All references to the Manœuvre Map, "Map of Country of KHED."*

The Mula, the Mutha Mula, and the Bhima rivers are the south coast line of a civilised State, of which the eastern, northern, and western boundaries coincide with the boundaries of the Poona district (*vide map*). Other independent States lie beyond these boundaries. The name of the State is KHED, and by this name it will henceforth be referred to.

KHED is a fertile country, and is also rich in iron, coal, and other minerals. Its capital, CHAKAN, is the centre of its commercial manufactures, and among other industries KHED has a large small arms manufactory at KHADKALA and an ammunition factory in the VISAPUR FORT, five miles south-west of KHADKALA.

In spite of the richness of the country the KHED Government, owing to mismanagement and extensive speculation, find it difficult to make the revenue meet the expenditure. Under these circumstances an unscrupulous Ministry determine to endeavour to cover their own defalcations by making illegitimate use of the Government small arms factory at KHADKALA and of the ammunition factory in Fort VISAPUR; in plain language by "gun-running."

This goes on successfully for some time, in spite of the endeavours of the British Government to discover where the arms and ammunition, which they know are continually being landed in the Persian Gulf, and hence passed into AFGHANISTAN, come from. At last the lucky capture by H.M.S. "PROSERPINE" of a dhow with 1,500 rifles, all marked "KHADKALA," and a large amount of ammunition marked "VISAPUR," throws light on the matter.

Remonstrances on the part of the British Government naturally follow, and many "Notes" are exchanged, but no satisfaction is obtained. In December, 1908, the British Government send KHED an ultimatum and issue orders for the mobilisation of an army corps, and for the





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preparation of the necessary transports. The KHEDITES are hoodwinked by their unscrupulous Ministry and the ultimatum is ignored.

The British Government declare war, and the Expeditionary Force embarks at Southampton on January 1st, 1909.

The KHED regular army, though small (about one Division) is quite as efficient as the British, and is believed to be more mobile. It is not known whether the KHEDITE people will be openly hostile, but it is certain that they will be passively so.

The sympathies of the States on KHED's eastern, northern and western boundaries are with that country, and, in the event of a reverse to the British arms, these States will probably throw in their lot with KHED.

KHED has no coast defence and its navy is too small to be seriously considered.

Except for the supposition regarding KHED's coastline all of the features of the country will be taken exactly as they are.

### SPECIAL IDEA, BRITISH.

*All references to the Manœuvre Map, "Map of Country of KHED."*

While the British Expeditionary Force is on the sea, European complications arise, and, in passing Aden, its Commander receives instructions to the effect that it is most desirable that the Khed Capital, CHAKAN, should be occupied and the factories at KHADKALA and FORT VISAPUR destroyed, as soon as possible; the KHEDITES being thus obliged to sue for peace and the British troops being set free for service elsewhere.

On receiving these instructions the General Officer Commanding the Expeditionary Force decides on the following plan of campaign:—

To land the Force in KIRKEE Bay.

To march himself with the 1st and 2nd Divisions on CHAKAN, and to order the 6th (Poona) Division to march on KHADKALA and VISAPUR.

The available suitable beach for a landing in KIRKEE BAY is known to be small, and, to avoid confusion, and also having in view the considerably greater distance of its objectives, the General Officer Commanding the Expeditionary Force directs that the 6th Division should land first. Further, in order that this Division may at once commence its march inland, he decides that the other two Divisions shall find all the necessary *personnel* for the defence and organisation of the base. But, owing to the divergence of its route from that to be taken by the rest of the Force, the General Officer Commanding orders that the 6th Division should provide for the safety of its own line of communication.

Subject to the above conditions the General Officer Commanding the Expeditionary Force gives the General Officer Commanding the 6th Division a free hand to carry out his instructions, merely (after, of course, seeing him personally) asking him to prepare and submit for approval a draft of his orders for disembarkation, and of his proposed plan of action as far as the latter can be foreseen.

At midnight on February 1st, 1909, the transports of the 6th Division are steaming with lights out and convoyed by cruisers in such a position that, should the weather remain favourable, the landing can commence by daybreak on February 2nd.

#### APPRECIATION OF THE SITUATION.

*All references to the Manœuvre Map, "Map of Country of KHED."*

In his interview with the General Officer Commanding the Expeditionary Force, the General Officer Commanding the 6th Division appreciates the situation (for that Division only) as follows:—

I. The 6th Division is ordered to take KHADKALA and Fort VISAPUR, and destroy the factories at those places.

II. The exact position of the KHED main army is not known.

It may, however, be safely assumed that, while mobile troops watch the coastline, the bulk of the army will be concentrated at some place from whence it can move quickly to oppose a landing at any threatened spot should sufficient notice be obtained, or, failing such notice, to bar an advance on CHAKAN, or on KHADKALA and VISAPUR.

Looking at the map, and then considering the communications, and also the fact that KIRKEE BAY is about the only place on the KHED coast line really suitable for the landing of a large force, it seems that somewhere in the vicinity of SHELARVADI station is a likely place for the concentration.

[For other reasons for this conclusion *vide* para. V. (B).]

The strength of the KHED regular army is known to be about a Division. How much of this will be placed in the field army is not known, but sound reasoning says it all should be.

The strength of the KHED Territorial Forces is not known, but it is considered that their fighting value would not be great in the open field, though they will probably be useful behind entrenchments.

III. The strength of the 6th Division is as in the "Order of Battle" attached. Its position at 12 midnight, February 1st, 1908, is at such and such a distance from the coast, that, should the weather continue fine, the Division should be able to commence landing at daybreak on February 2nd.

IV. Considerations which appear to affect both sides are as follows:—

(A) *Relative Strengths*.—These are actually about equal, but the KHEDITES have also to deal with the rest of the Expeditionary Force, and possibly they may think it necessary to detach some Regulars to stiffen their Territorial Garrisons. It may therefore be assumed that, at the point of contact, the 6th Division should find itself superior in numbers by from 3 to 2 to 4 to 1.

This is none too much when strong positions may have to be attacked.

(B) *Moral*.—This may be taken as equal. Whatever fears the Khedites



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may have will be allayed by the hope of their neighbours joining with them in catching us in a trap. Our troops will feel, as they always do, that whatever their Commander orders *will* be carried out.

(C) *Possible Reinforcements*.—Having in view the European complications which have arisen (*vide* Special Idea, British), reinforcements for the Expeditionary Force as a whole do not seem probable, even if the Government has them, and the necessary transports ready. It does not, however, seem unreasonable to think that the other two Divisions, being so close, should be able to give the 6th Division some assistance should it get into difficulties.

On the other hand, should the neighbouring States of PEN-KARJAT, THANA, and AHMEDNAGAR join KHED, the numbers of the enemy's regular troops will be more than trebled.

(D) *The Influence of Politics*.—It seems that this will considerably affect both sides. For us it will certainly mean hurry, probably the leaving in KHED of too small a force after the operations are over, and possibly even a complete withdrawal before they are really concluded.

For KHED the influence of politics will probably act both ways. In the first place the unscrupulous Ministry, fearing the populace, which it has hoodwinked and brought to invasion, will naturally be adverse to risking the whole of the small regular army in trying to deal a decisive blow. Its strategy will, therefore, be narrow-minded, weak, and vacillating.

In the second place, it appears probable that politics will be favourable to KHED, in that the natural sympathies of the neighbouring States will bring them to its aid, especially when they know that the force we have landed is not a very large one, and when they hear of our European complications.

Thirdly, it may be said that, should the capital and the factories be taken and the neighbouring States not join them, such a Government as KHED has will sue for peace at once, rather than embark on a guerilla war for which their country, to the north of an east and west line, drawn about 10 miles north of CHAKAN, is suitable, but which (*i.e.*, such a war) would entail the loss of all that they govern for—*viz.*, position and emolument!

(E) *Topography*.—The country which lies between KHADKALA and CHAKAN and the coast is very similar to that which extends for some 30 miles to the north and north-west of Poona, in India. For some 10 miles inland to the north and north-west of KIRKEE BAY the country is comparatively flat, and, though undulating, dotted with kopjes and patches of cultivation, and intersected with nullahs, it offers no great obstacle to the movements of all arms.

The same may be said of the upper valleys of the PAUNA and INDRA-YANI rivers, *i.e.*, those portions to the west and north-west of SHELARVADI station, though the movement of troops is naturally more restricted as these valleys become narrower.

It is near SHELARVADI station that the eastern end of the range of the hills, on which Fort VISAPUR stands (some 15 miles away to the west), juts out into the plain, and divides the upper valleys of the PAUNA and INDRAYANI rivers.

To describe this range is to describe the nature of all the hills shown in the map. Its altitude is about 2,000 feet, its sides are steep and rugged, and covered with sharp-edged boulders, and here and there with scanty brushwood. Its top varies from 100 yards to half a mile wide, is fairly flat and covered with grass. The range is quite unsuited for the action of, though not absolutely inaccessible to, mounted men. In places on it it is possible to man-handle guns up specially prepared paths, or improved existing tracks.

The rivers, which may be taken to be in the possible sphere of the operations of the 6th Division, are as follows:—

(1) The PAUNA (for course *vide* map).

Though its banks are steep in places, this river is passable almost anywhere at this time of year (February).

(2) The INDRAYANI (for course *vide* map).

The same remark applies to this river as to the PAUNA.

The most important strategical point appears to be the spot where the KIRKEE-KADKALA roads and the G.I.P. Railway run between the VISAPUR range and the INDRAYANI river, north of SHELARVADI station.

(F) *Positions*.—Judging from the map it does not appear that the country, especially as regards the general direction of the watersheds, lends itself well for the enemy to bar an advance on KHADKALA by the direct road from KIRKEE BAY, because the left flanks of all of the map positions facing south are “*en l’air*,” and easily turned by the plain between them and the INDRAYANI river.

The possible exception may be the high ground south of TALEGOAN DABHADA, used in conjunction with the river above mentioned as far east as DEHU. It does not seem unlikely that the enemy may make a stand here.

On the AHIRVADI-LONAVLA road (and the former place is the one alternative landing-place to KIRKEE BAY, there appear to be many places in which a few determined men could bar the road and take a long time to turn out.

(G) *Communications*.—As far inland from KIRKEE BAY as SHELARVADI station, there are three roads the Division could use (*vide* map), the centre one being the main one and in very good repair; the other two are quite usable at this time of the year (February). There are no severe gradients on any of these roads.

North of SHELARVADI the map shows the main road only, but there are probably some country roads and paths which could be used.

The AHIRVADI-LONAVLA road has been mentioned in para. (F) Apparently some of its gradients are steep.

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The Great Indian Peninsula Railway, a broad-gauge double line, runs direct from KIRKEE BAY to KADKALA without apparently crossing any bridge of importance before reaching the latter place; therefore any damage that the enemy may do to the line should not take long to make good. This renders it important for us to endeavour to seize any rolling stock there may be at KIRKEE, directly we land.

(H) *Supply*.—The country is fertile and thickly populated, *hence supplies should be plentiful*. On the other hand, the inhabitants are hostile and may hide, carry off, or destroy a great deal of the supplies. However, ready-money, especially in their own coinage, will generally induce some of the inhabitants of *any* country to produce supplies when they exist!

(K) *Climate*.—At this time of the year almost perfect for campaigning without tents. There is no rain, the days are warm, and the nights are cool, but not too cold.

(L) *Water*.—There should be an adequate supply—for men from the numerous *wells*, and for animals from the many *tanks*, and the pools in the beds of the half-dried rivers and streams.

V. These appear to be as follows:—

(A) On receiving news as to the locality of a landing, to hurry all available troops to the spot and endeavour to oppose the actual landing.

Judging by the map the communications do not lend themselves to this, except in the case of KIRKEE BAY. Further, should such news be merely that of a feint of landing, the Khed Commander might find himself farther away from CHAKAN and KHADKALA than we were at the spot at which we *actually* landed. In this case we, with our superior strength, could mask the Khed Field Army, and march straight on the Capital.

Though history shows that such a course has sometimes resulted badly (even for Napoleon), it is certainly one that the Khed Government would fear to take the risk of giving us the opportunity of adopting.

(B) Watch the coastline with a few mobile troops and armed inhabitants, and keep the main army concentrated at some place from which it could march easily and quickly to bar an advance on CHAKAN, KHADKALA, or VISAPUR, and possibly even to engage us before our landing was completed.

Looking at the map, SHELARVADI Station appears to be the most suitable place if this course is adopted, for the following reasons:—

(1) It is about equidistant from CHAKAN, KHADKALA, and VISAPUR.

(2) It is in the centre of the possible position for barring our advance mentioned in para. IV. (F), and troops concentrated there could be working at the preparation of this position.

(3) From there three good parallel roads lead direct to KIRKEE BAY.

(4) SHELARVADI is on the direct road and railway line to KHADKALA, and is connected with CHAKAN by the main road in two directions (though

by somewhat circuitous routes), and it probably has country roads which lead direct to the Capital *via* DEHU, and also *via* CHICKLI.

(C) Possibly the enemy may think that his Field Army is too small to seriously oppose our advance, and may merely harass it and defend his vital points, trusting to the neighbouring States to intervene before these are taken.

(D) He might draw off to a flank—say, base himself on the TIKONA Fort—and strike at our communications. In this case we should have to again decide whether we should mask him and march on, or diverge and try and bring him to action. It does not, however, appear probable that the Khed Government would consent to its Field Army adopting this course.

(E) Thinking it hopeless to really stop our advance, the enemy might again merely harass it, abandon the Capital, and also KHADKALA, and transfer the seat of Government to JUNNAR. This would be following the example of the Boers prior to the occupation of Pretoria. It would oblige us to fight a guerilla war in the intricate country north of Chakan, would indefinitely prolong the campaign, and render it much more difficult and costly for us.

Fortunately, we may again assume that such a self-sacrificing, patriotic step will not commend itself to the selfish Khed Government.

Reviewing the five above-mentioned courses which seem open to the enemy, it seems that we may say that, though the last-named would, because of the time it would give for PEN-KARJAT, THANA, and AHMED-NAGAR to make up their minds, and for our European complications to develop, and so make us unable to spare three Divisions for a side-issue like the Khed Campaign, be the best, in the long run, for the enemy to adopt, yet it is most probable that he will actually adopt course (B).

In dealing with the enemy, should he adopt course (B), we must never forget that we must try to so severely handle him that he has no heart left to afterwards adopt course (E), which is the one that would be the most inconvenient for us.

[N.B.]—Nothing is known of the character of the KHED Commander.

VI. There seem to be three courses open to us :—

(A) To move the whole Division by the KIRKEE BAY—KHADKALA main road, dealing with circumstances as they arise.

(B) To move the whole Division by the AHIRVADI-LONAVLA road.

(C) To move the bulk of the Division as in (A), and a detachment as in (B).

(A) is sound, though may not be brilliant, strategy.

(B), having in view the nature of the road and of the country, and also the distance that the Division would be from the other two Divisions, with a difficult country intervening, does not seem sound strategy.

(C), though there may be some slight risk for the detached force using the AHIRVADI-LONAVLA road, seems to be the best course for many reasons.

(1) It will *surprise* the enemy, as it will probably be unexpected.

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(2) The detached force on the AHIRVADI road will act as a *flank guard* to the rest of the Division.

(3) The detached force will be able to watch the PEN-KARJAT border, and its presence will act as a deterrent to that State.

(4) On receiving the news of the two landings the enemy will be in doubt as to which is the real one, and will thus be mystified.

(5) The landing at AHIRVADI will give a *second base*, which our complete command of the sea makes quite safe.

(6) The detached force, by giving a second pivot, will increase the power of manœuvre of the 6th Division, while it will only be some 15 miles off from the left of the rest of the Division, and the two forces will be converging all the time.

(7) Should the enemy hold the position named in para. V. (B), the detached force can strike at his communications with KHADKALA and VISAPUR.

(8) Should the enemy decide to withdraw to a flank, as mentioned in para. V. (D), the detached force will threaten his rear.

(9) The detached force should compel the enemy to detach troops to protect KHADKALA and VISAPUR.

(10) The most effective way to use superior force is to *envelop* the enemy. The two lines of advance give the General Officer Commanding the 6th Division power to do this from either flank.

(11) The detached force places that part of the Khed Army that may oppose the *direct* advance from KIRKEE BAY in the awkward position of having its line of communications more or less *parallel* to its front.

(12) If not directed to converge towards the rest of the Division before it reaches LONAVLA, the detached force can place itself astride of the railway line and the road at that place. It will then cut the direct line of the Khed communications with PEN-KARJAT. In any case some portion of the detached force should be able to break up the line and cut the telegraph wires.

(13) Finally, with average fortune, the detaching of the 1st Brigade should enable the General Officer Commanding 6th Division to bring about what Moltke has laid down as the highest form of generalship, that is the junction of two previously separated forces on the field of battle, and thus so thoroughly crush the enemy that he will not be able to do what would be the most inconvenient thing for us that he could do, viz., fight a guerilla war in the difficult country to the north of KHADKALA and CHAKAN.<sup>1</sup>

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<sup>1</sup> There were also five outside reasons for the detaching of this brigade: (1) To give a brigadier a taste of his own; (2) to test the system of communication; (3) to see if the move could be kept secret until the brigade "landed"; (4) to create additional interest; (5) to illustrate what Moltke has called the most difficult operation of war, i.e., the concentration of previously separated forces on the field of battle.

It may be objected to this detachment that it so weakens the 6th Division that it might not be strong enough to attack the enemy, should he occupy the position named in para. V. (B).

Against this objection it can be said that, should proper direction of the detached force fail to enable the General Officer Commanding the 6th Division to manœuvre the enemy out of this position, or to compel him also to detach troops, the other two Divisions will be so close to the 6th Division as they advance on CHAKAN, that to temporarily detach troops from them to its assistance would be easy and delay their advance (for which there is more time than for that of the 6th Division) but little.

VII. The General Officer Commanding the 6th Division proposes the following:—

The 6th Division to land at daybreak (covering parties landing just before) on February 2nd, as follows:—

(a) 2nd Infantry Brigade, Mountain Battery (4 guns), Half-Company Mounted Infantry, Half-Company of Sappers and Miners, under the Command of Brigadier-General J. C. Swann, C.B., to land at AHIRVADI and march on LONAVLA by AHIRVADI-LONAVLA road.

(b) The rest of the Division to land in KIRKEE BAY and march on KHADKALA by the main road.

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#### NOTES.

(1) Communication to be maintained between the 2nd Brigade and the Divisional Headquarters in four different ways:

I. By wireless telegraphy between AHIRVADI and KIRKEE BAY, and hence by air line from each end to the headquarters of the respective General Officers Commanding.

II. By cable direct, as the respective headquarters advance.

III. By visual signalling.

IV. By mounted men.

(2) More mounted troops are not sent with the 2nd Brigade on account of the unsuitable nature of the country for them.

In proposing the above line of action the General Officer Commanding the 6th Division has taken into consideration all the points mentioned in para. VI. (C), and also the two facts that, owing to the European complications, and the probable intervention of the States of PEN-KARJAT, THANA, and AHMEDNAGAR, it is necessary that the objects in view be accomplished *quickly*, and that it is also necessary that the enemy be so crushed and crippled that he is not in a position to embark on a guerilla war, and by so doing prolong the campaign indefinitely, with the result that the European complications may compel the British Government to withdraw the troops before the Khedites can be brought to terms.

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##### COURSE OF THE CAMPAIGN.

Briefly what took place was as follows:—

On the night of January 31st the 2nd Brigade with a Mounted Battery, Half-Company Mounted Infantry, and Half-Company Sappers and Miners, commenced to march to AHIRVADI (AHIRVADI represented a second port of disembarkation). It “disembarked” at AHIRVADI at daybreak on February 2nd, and marched on LONAVLA and KHADKALA.

The 1st and 3rd Brigades and the remainder of the Divisional troops landed at daybreak on February 2nd in KIRKEE BAY and marched towards KHADKALA.

On February 4th, at about 5 a.m., the 2nd Brigade was caught in a perimeter camp and wiped out. An hour afterwards the KHEDITE force was hemmed in by the 1st and 3rd Brigades and had to surrender, and the prisoners of the 2nd Brigade were retaken. This ended the first part of the war.

On February 5th, at 4 p.m., the neighbouring tribes PEN-KARJAT, THANA, and AHMEDNAGAR (represented by the KHEDITE force) came on the scene. The British force, which, on account of European complications, had been ordered to re-embark, then fought a rear-guard action from VADGAON towards the base at KIRKEE BAY.

As soon as the General and Special Ideas had been made known all medical officers were ordered to send an “appreciation” as soon as possible to the Headquarter Offices at Poona, and were directed, in this appreciation, to pay special attention to the following points, viz.: Description of the force, its composition and strength (Poona Division only, *less* Bombay Brigade), complete medical *personnel* and hospital establishments required for such a force (*vide* Field Service Departmental Code, Medical; Field Service Regulations, India, War Establishments; Field Service Pocket Book); medical arrangements on the line of communication and transport of sick from front to base; medical arrangements required on line of march and position of medical units; natural features of the country; supplies, especially local supplies; amount of sickness expected on such a campaign from (a) sickness; (b) wounds, how the former might be influenced by season, climate, &c.; special sanitary precautions to be observed; any matters in connection with the Geneva Convention; medical officers’ orders, how issued in a Brigade (*vide* combined training); a brief explanation of the following returns rendered on field service: A.F.’s, A. 6, A. 7, A. 28, and A. 29; A.B.’s, 27 A. and 27 B.; A.H.F. 110, and F.T.F. 37; and finally any other points of medical interest connected with the forthcoming campaign.

The appreciations sent to the Headquarter Office showed that a great deal of trouble had been taken in their preparation and they were thorough in every detail.

On February 1st, at the Headquarter Office, the Principal Medical Officer of the Division, Surgeon-General A. T. Sloggett, C.M.G., addressed the assembled medical officers, and in a few words explained the object of their attendance at manœuvres.

Each medical officer was directed to keep a diary and enter in it everything that took place that concerned his unit, every order that he would have given and every arrangement he would have made had the manœuvres been a reality, and to forward a report at the close of the campaign to the Principal Medical Officer, Field Force, to enable that officer to complete a war diary ordered by the General Officer Commanding. On the line of march officers were visited and questioned respecting medical arrangements made for advance guards, flank guards and rear guards; also as to arrangements for medical assistance such as the positions of collecting stations, dressing stations, and field hospitals, and how wounded men were to be succoured and disposed of. When in bivouac, medical officers were questioned on sanitary matters, camps, and so forth.

During temporary cessations of hostilities, or during an armistice, as many medical officers as possible would meet to compare notes and talk over the events of the previous day or days. The following conclusions were arrived at by the majority of medical officers assembled in the Divisional Headquarter Camp on the night of February 6th, at SHELARVADI, when hostilities had ended :—

#### REMARKS.

##### (1) *Medical Aid for Cavalry.*

A great deal has been written and said about medical assistance for the cavalry, and the more I see of cavalry working on manœuvres the more I am convinced that medical assistance according to regulation is inadequate.

Cavalry are an uncomplaining lot, it is death or glory with them; no one would attempt to deter them from obtaining as much glory as possible, but it is our duty as medical officers to try and lower their death roll, and to do this I would recommend either that (1) the bandsmen be highly trained in first aid (King's Regulations, para. 834), mounted, and be told off in sections of six to each squadron with a certain number of Colonel Hathaway's cradles and a small amount of surgical equipment carried on two mules; should



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a man be so severely wounded that he could not be moved then one of these bandsmen should remain with him until succoured by the cavalry field ambulance, which is really only of use in general cavalry engagements ; or (2) that a certain number of Royal Army Medical Corps non-commissioned officers and men go through a course of equitation, be mounted and attached to each cavalry field ambulance for use with independent cavalry ; or (3) that some of the four non-commissioned officers and thirty-four privates of the bearer division of each cavalry field ambulance be trained in like manner and used with independent cavalry as required.

In India the fast moving field hospital takes the place of the cavalry field ambulance, and the Royal Army Medical Corps are represented by the Army Hospital Corps and Army Bearer Corps, the remarks above apply equally to the last-named units.

### (2) *Divisional Troops.*

The divisional troops are always a source of anxiety to the Administrative Medical Officer (Principal Medical Officer in India) for there is no medical unit appointed to look after their welfare. Some of them are occasionally attached to a brigade, and are supposed to be attended by an officer detailed by the senior medical officer of that brigade, but more often they work by themselves. The three field artillery batteries, the howitzer brigade, the heavy battery, and the mounted infantry are the units mostly concerned. In the Indian army a field hospital is allotted to the divisional troops on mobilisation, but the British army has no such unit. In practice the three field ambulances would invariably be employed with the three infantry brigades.

A horse artillery brigade has a medical officer in medical charge of two batteries. A field artillery brigade (three batteries and ammunition column) has one medical officer. A heavy artillery battery (248 officers and men) has no medical officer, but is dependent for assistance on the medical officers of the howitzer brigade.

Manœuvres have taught, and they teach more than books, that a medical officer is absolutely necessary on active service for each battery (nearly 200 officers and men), therefore the batteries of a division are seven medical officers short. It is an utter impossibility for one medical officer to look after three batteries at once, experience having proved that they are often in action miles apart ; for the same reason it is likewise impossible for the medical officer of the howitzer brigade to attend to the sick and wounded of the heavy battery (*vide* War Establishments, p. 2), and for the medical

officer in an infantry brigade to look after his own battalion in action as well as any battery attached to it.

To recapitulate, there should be a cavalry field ambulance with divisional troops and a reserve of medical officers to provide for units dividing up, and for casualties amongst medical officers, a most important matter which is never given any consideration.

(3) *The Senior Medical Officer of a Brigade.*

The appointment of Senior Medical Officer of a brigade should be a separate appointment; he should not be the senior medical officer doing duty with one of the battalions, for his position then becomes an anomaly.

His position should correspond with an administrative medical officer of the divisional staff; he should be a senior lieutenant-colonel and qualified in sanitation and always remain with or near the brigade headquarters. The brigadier frequently desires to consult his senior medical officer regarding something medical he wishes to know or requires inserted in his operation orders, and if the senior medical officer be with his battalion he may be miles away from headquarters when he is wanted.

(4) *Line of Communication in India.*

The removal of sick and wounded from the field hospitals to the base is not according to any definite plan.

A field hospital, or a section of one, is dropped when occasion arises, and becomes a non-dieted stationary field hospital of the line of communication. Perhaps some day stationary hospitals, the same as those of the British organisation, will be authorised and include some of the members of the Q.A.M.N.S.I. and their *personnel*.

Clearing hospitals are not known as such, but one section of every field hospital is lightly equipped; in my report upon the manœuvres I recommended that this section should be provided with good transport (mule tongas and riding mules) and be utilised to evacuate sick from one field hospital to another along the line of communication and bring up medical and other stores.

Sanitary sections and squads do not exist on the line of communication in India.

(5) *Equipment.*

Medical officers on active service carry their own pocket case of surgical instruments and it would be a great boon if, at

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Government expense, they could be provided with a miniature "tabloid" and a hypodermic case, the former similar to the one contained in the "Field Medical Companion" (home service), but smaller. On the march, and especially at night time on manœuvres, these additions would often prove most useful.

A small amount of surgical equipment carried on the limbers of field guns would also be of service.

### (6) *Wounded Men.*

Wounded men are often very hard to find, especially when the fighting takes place in long grass, millet, rice and jowari; a man should be directed, if he cannot walk, to fix his bayonet and stand his rifle on end, the bayonet being fixed in the ground. The butt of the rifle would easily be seen by the stretcher-bearers, and many valuable lives would be saved. Only about 2 per cent. would be unable to do this. The value of this suggestion was exemplified at Indori Bridge fight and in other engagements during the manœuvres.

### (7) *Spine Pads.*

One battalion (2nd Worcester Regiment) wore spine pads, or spine protectors, of thin material, coloured red, black, and yellow, but it was not more free from heatstroke than the other battalions, (*vide* list of casualties attached.)

The manœuvres brought forth many other interesting points and the operations gave an opportunity of studying service conditions both in the hills and in the open country, and of contrasting the British and Indian field medical organisations. The endurance of the troops was marvellous; the nights were very cold and the shade temperature in the middle of the day over 90° F., also the marches were long and trying, and meals and sleep hours irregular. Notwithstanding these viscissitudes the general health of the troops remained good; the number of casualties, British and native, is shown in the attached base hospital returns.

BASE HOSPITAL, KIRKEE. BRITISH TROOPS.  
*Return of Sick from Poona Divisional Manœuvres, 1909.*  
 From February 2nd to 7th, 1909.

Corps	N.C.O.'s AND MEN										OFFICERS		REMARKS
	Diarrhoea and dysentery	Malaria	Veneral diseases	Digestive system	Organs of locomotion	Heart-stroke	Local injuries*	Skin diseases	Other general diseases	N.A.D.	Total	Local	
R.F.A. .. ..	..	..	..	..	1	..	1	..	..	..	2	1	Wound scalp.
R.G.A. .. ..	..	..	1	..	..	..	2	..	..	..	3	..	..
1st Northampton Regt.	..	10	..	..	1	1	12	1	1	1	27	..	..
1st Lincoln Regt.	4	2	..	..	4	2	8	2	3	..	30	..	..
2nd Wores. Regt.	..	4	1	5	..	1	1	..	1	..	9	..	..
2nd Leics. Regt. ..	1	..	1	1	..	..	..	..	..	..	4	..	..
1st Glouce. Regt.	..	7	..	2	..	1	2	..	..	..	10	1	Sprained foot.
East Surrey Regt.	..	..	..	..	..	..	..	..	..	..	..	1	Contusion face.
Total .. ..	5	23	3	8	6	5	26	3	5	1	85	3	

\* Includes 20 cases of sore feet.

STATEMENT SHOWING THE NUMBERS OF ADMISSIONS TO THE NATIVE BASE HOSPITAL, KIRKEE, DURING THE DIVISIONAL MANŒUVRES.  
KIRKEE, FEBRUARY 9TH.

Name of Corps	Chicken-pox	Enteritis	Gonorrhoea	Influenza	Malaria	Mumps	Pneumonia	Pyrexia	Tubercle lung	Scabies	Conjunctivitis	Gum-boll	Dyspepsia	Diarrhoea	Soft chancre	Abscess	Urticaria	Eczema	Blisters	Contusion	Sprain	Wound	Fracture (clavicle)	Fracture (humerus)	Fracture (femur)	Burn	Total
3rd Sappers and Miners	..	..	1	..	..	..	..	1	..	..	..	..	1	..	..	..	1	..	..	1	..	..	..	..	..	..	5
107th Pioneers	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	1
80th Carnatic Infantry	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
114th Mahrattas	..	..	2	..	..	1	..	..	1	1	..	..	..	1	..	1	..	..	..	..	1	2	..	..	..	..	10
127th Beluchis	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	1	..	1	..	..	3
26th Light Cavalry	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	1	..	1	..	..	3
110th Mahratta Light Infantry	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
123rd Rifles	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	1
73rd Carnatic Infantry	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3
79th Carnatic Infantry	..	..	..	..	..	..	..	1	..	..	..	..	..	1	..	..	..	1	..	..	1	..	..	..	..	..	5
34th Poona Horse	..	..	..	..	..	..	..	3	..	..	..	..	1	1	..	..	..	..	..	..	..	1	..	..	..	..	5
64th Pioneers	4	1	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	..	..	..	..	7
66th Punjabis	..	..	..	..	..	..	1	..	..	..	..	1	..	..	1	..	..	..	..	..	..	2	..	..	..	..	5
103rd Mahrattas	..	1	..	..	1	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	2	..	..	..	1	7
Total ..	5	2	1	4	4	2	1	6	1	1	1	1	1	3	1	1	1	1	1	3	1	11	1	1	1	1	57

## HINTS ON CAMPING ARRANGEMENTS FOR SANITARY OFFICERS.

BY CAPTAIN R. TILBURY BROWN.

(Continued from p. 638.)

### PART IV.

#### DETAILS OF SANITARY METHODS.

THERE are many methods of dealing with excreta, refuse, &c., in camp, but only those are described which do not involve the use of appliances, and which have been tried in England and found satisfactory.

The following is given as a *type* of sanitary instructions to be issued before the camp is occupied.

#### SANITARY INSTRUCTIONS.

(a) *Latrines* will be 3 feet long, 1 foot broad, and not deeper than 1 foot. The space between each trench will be 2 feet 6 inches. Trenches must be arranged as far as possible in one line.

When filled in, the next series of trenches may be made in the 2 feet 6 inches interspace. The turf must be removed carefully, and the excavated earth put behind each trench; this earth must be well broken up.

Trenches must be carefully and solidly filled in and the turf replaced.

Some kind of implement (*e.g.*, an empty tin or a spade for at least every three trenches) must be kept behind each trench for replacing earth. (See fig. 1.)

(b) *Urinals*.—Dig a pit 4 feet square and refill loosely with earth; from the pit dig two shallow trenches 12 feet long, 2 feet wide, and having a fall of 1 inch for each foot of length towards the pit. Place some stones in the trenches, and when foul fill in and make fresh ones. Cover the pit with brushwood and earth. (See figs. 2 and 2A.)

(c) *Urine Pit* (for Contents of Urine Tubs).—Dig a pit 5 feet deep by 4 feet square, and refill loosely with earth to 1 foot from the top; add a little fresh earth daily.

(d) *Urine Tubs*.—These must not be placed in the lines, but along the streets and flanks, and marked by whitewashed posts upon which lights are to be hung at night. At least four will be placed close to the canteen. Tubs will be emptied at 10 p.m. and at *réveillé*.

(e) *Drinking Water*.—Stand pipes and taps. Excavate an area of ground around each pipe or under each tap, size 4 inches deep and 3 feet square. From the centre of this square dig a trench 2 inches wide along the fall of the land to a small soakage pit. Fill in the square and trench (and pit, if in an exposed place) with small stones and ram down, refill the soakage pit loosely with earth. (See fig. 3.)

(f) *Camp Refuse*.—All camp refuse is to be burnt. Suitable crematories are shown in figs. 4 and 5.

(g) *Greasy water* must be strained through bracken or heather before entering a soakage pit. A simple form is shown in fig. 6. Refill the soakage pit loosely with earth to 1 foot from the top, and add a little fresh earth twice daily.

(h) *Empty tins* must be burnt in the crematory and then buried.

(Rough diagrams of the following figures should accompany the orders.)

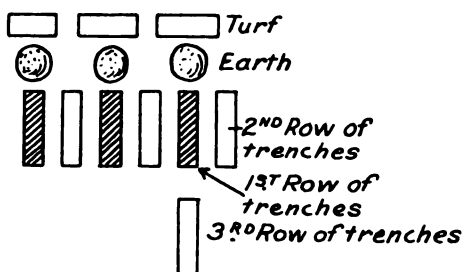


FIG. 1.

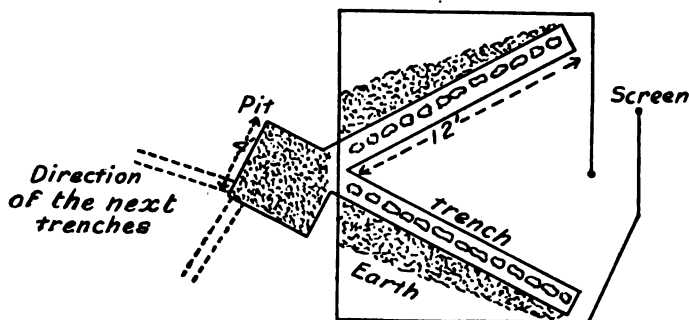


FIG. 2.

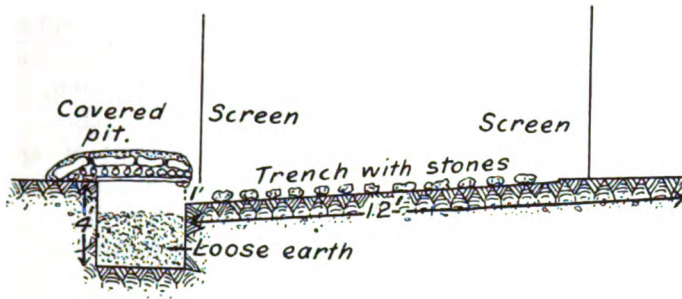


FIG. 2A.

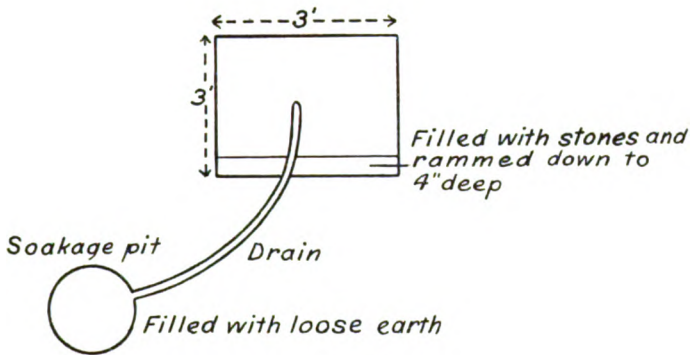


FIG. 3.

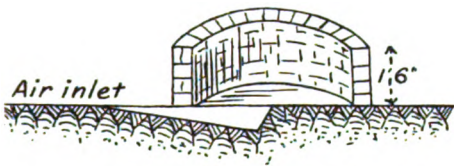


FIG. 4.



FIG. 5.

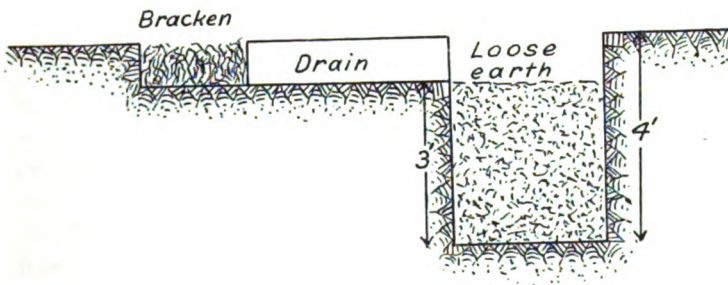


FIG. 6.



## SHALLOW TRENCH LATRINES.

*Size.*—3 feet by 1 foot by 1 foot, arranged in one line, and with a  $2\frac{1}{2}$ -feet interspace.

*Number.*—It is usual to allow five for every 100 men, but 500 men can do very well with 3 per cent., *i.e.*, fifteen trenches.

*Time Trenches Last.*—As a rule only one day; if space is limited and the trenches are not filled in one day, dig fewer. A trench can be made to last longer if the contents, which tend to get heaped up in the centre, are levelled off, and if the earth for covering is finely broken up.

*Depth.*—1 foot is the ideal depth, but if ground is limited they can be dug deeper, to 2 feet. These deeper trenches should last two days. A regiment, 500 strong, had twenty-five trenches 2 feet deep, it was in camp for thirty days, and each trench lasted four days. Another regiment, 550 strong, used fifteen trenches  $1\frac{1}{2}$  feet deep, each trench lasted two days, the camp was for eighteen days, and the trenched ground was 20 yards by 10 yards. Another regiment, 440 strong, used ten trenches  $1\frac{1}{2}$  feet deep, each lasted two days, the camp was for seventeen days, and the trenched ground was 20 yards by 15 yards.

*Interspace.*— $2\frac{1}{2}$  feet is a convenient breadth, it allows plenty of room for another trench to be dug in it; men using the second trench have 9 inches of firm ground for each foot, and there is an economy of space. A 3-feet interspace has the advantage of allowing more room between trenches, but it entails a longer frontage, more than exists with a minimum camping ground, and it also requires a greater length of screening.

*Method of making Trenches.*—Suppose B is the base line of the camp, that trenches are to be dug to the rear, that the number of men is 200, and the probable length of occupation is thirty days.

Two hundred men require ten trenches (at 5 per cent.) with a frontage of 12 yards (2 by 6, see Part I.).

Thirty days' occupation will require a depth of 20 yards (30 by  $\frac{2}{3}$ , see Part I.).

From B, and at right angles, measure off 20 yards, B-C, and drive in a peg at C. From C take C-D, parallel to base of camp, and 12 yards long. C-D equals line of first row of trenches. From C, along C-D, measure off 1 foot and  $2\frac{1}{2}$  feet spaces alternately, marking the spots with a spade till there are ten 1-foot spaces. To do this it is convenient to use a stick which is 3 feet long and marked at 1 foot and  $2\frac{1}{2}$  feet, or a cord looped at one end and marked by pieces of coloured rag.

From C measure 3 feet, C-E. From E and parallel to C-D mark off alternate spaces as before, and join up. This outlines the first row of trenches.

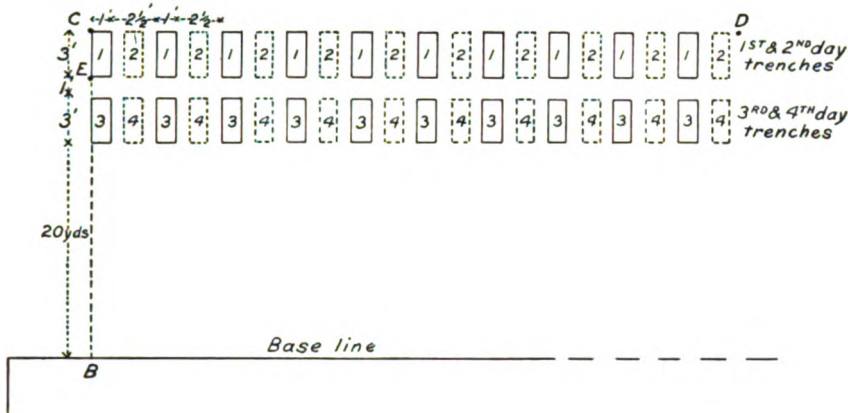


FIG. 7.

Remove the upper sod of each trench in one piece as far as possible, and put it about 3 feet behind the trench.

Excavate the trenches till they are 1 foot deep, keeping the sides vertical, and placing the excavated earth immediately behind the trenches. This earth should be finely broken up.

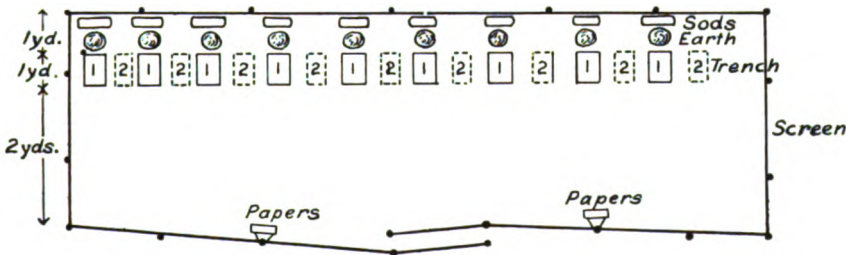


FIG. 8.

Surround the trenches with a canvas screen, the back being 3 feet behind and the front at least 6 feet in front of the trenches. The entrance should be in the centre of the front and have a 6-foot overlap. The length of screening necessary for 1,000 men on a 5 per cent. basis will be 130 yards; if twenty-five trenches are used, they will require 70 yards.

On the second day fill in the trenches with the remaining

excavated earth, replace the sod, and tread and beat down firmly. The advantage of the large upper sod is obvious.

Dig the second day's trenches in the interspaces of the first row.

On the third day, dig a row of trenches similar to and parallel with the first row, and 1 foot in front. Move the screening forward so as to surround them properly.

*Articles for covering Excreta with Earth.*—Small G.S. shovels are the best, one for every two trenches. If shovels are not available, grocers' scoops answer the purpose very well. Improvised articles, such as empty food tins, scoops made of tins with wooden handles, &c., can be provided, but one per trench is required. An article of some sort must be provided, and pushing earth into the trench with the boot is most undesirable.

*Supervision of Latrine.*—Considerable supervision is required until the men become accustomed to straddling the trenches and covering their excreta immediately with earth.

It had been found useful, at first, to police the latrine by a man who remains on duty until he finds another man neglecting to cover his excreta. This, however, soon becomes unnecessary, and it is found best to police the latrine by a man of the sanitary police, who is on duty during fixed periods not exceeding two hours at a stretch.

*Paper.*—Paper should be kept in boxes fitted with lids and attached to the front screen inside the latrine.

Unless the men cover the paper with earth immediately, it is very apt to be blown about the latrine and even gets outside.

*Seats.*—I am not in favour of seats for the men, and when used for officers and N.C.O.'s they should be separate and in the form of *half-seats*.

The seats should have a covering and be placed across the trenches, with the front of the seat only about 6 inches behind the front of the trench, otherwise there is much fouling at the back of the trench.

After the latrine has been prepared, examine the slope of the land, and, if necessary, dig a shallow drain to divert surface water from the trenches, taking care that it does not flow on to the ground in front of the trenches, which will have to be used later on. This also applies to urinals.

#### DEEP TRENCH LATRINES.

Size, &c., see Part 1.

Two inches of the driest earth available must be thrown over the contents of the trench at least twice daily. When the contents

are within 2 feet of the top of the trench, fill in and heap up the earth over the trench. Lime should be sprinkled in front and rear of the trench, as well as inside it twice daily. Keep the pole seat clean with hot water and soda, or cresol solution applied daily. Dig a shallow surface drain on the higher side of the trench.

*Urinal.*—The urinal previously described (fig. 2) is suitable for a regiment of full strength (1,000), but if two arms are not enough make another. For a small detachment make a smaller pit with a single short arm.

It is important to have the arms or trenches at least 2 feet wide, and to have stones in them, as it helps to prevent fouling of the ground. Should the ground get foul, sprinkle lime on each side of the trenches as well as inside them; I have not found this necessary, but it might be so in very hot weather.

The ground around a urinal should be burned when another has to be dug or the camp evacuated.

Every two or three days look into the pit to see its condition and add a little fresh earth.

The position of *urine tubs* and the *urine pit* for the contents of the tubs has been described. Stands for the tubs are easily improvised with empty boxes filled with earth. If only required for one night, dig a shallow trench for each half-company and hang a light by it.

*Greasy water.*—Water from cook-houses and from the washing of cooking utensils must be strained. Straining material may be bracken, heather or gorse, or even grass, hay or leaves. It must be in small pieces and packed down pretty firmly into the straining pit and across the outlet. The material must be removed and burnt twice daily. The straining pit (fig. 6) is convenient and simple, but a coarse strainer adds to its efficacy. A coarse strainer may be improvised with a box and a biscuit tin.

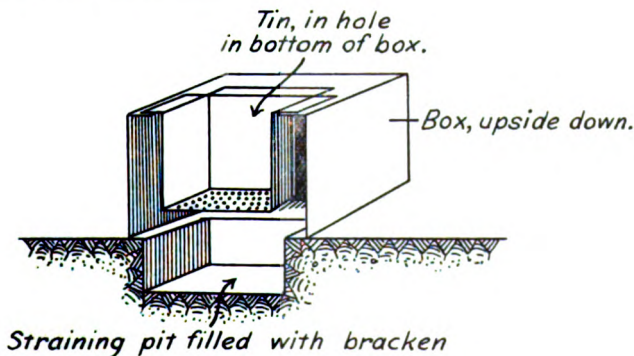


FIG. 9.

Care must be taken that the straining pit is not deeper than the drain from it, and the pit should be close to the cook-house. The drain should be narrow and have an even fall; if traffic has to cross it, it should be filled with large stones.

#### REFUSE INCINERATORS.

(1) The best incinerator, especially when sods can be obtained, is a square or cylinder 3 feet high. It is not suitable in peaty ground. If iron bars are obtainable they should be placed across the inside valve, the air inlets to form a grating.



FIG. 10.

(2) If in peaty ground, or if there is not time to build (1), employ the low cylinder shown in fig. 4.

(3) The horse-shoe mound (fig. 5) acts well in any soil.

All these incinerators are improved by facing the inside with puddled clay.

All indestructible refuse, *e.g.*, tins, must be moved from the incinerator every morning and buried.

#### WATER.

A method of preparing ground beneath taps has been described. The V-shaped *ablution bench* is much better than the ordinary grating; the ground around should be drained, and the ablution water must be disposed of as in Part I.



## Editorial.

### THE DEVELOPMENT OF TRYPANOSOMES IN TSETSE-FLIES.

IN the appendix to "Further Report on the Tsetse-fly Disease or Nagana in Zululand" Bruce recorded the first experiments made to ascertain whether a developmental cycle in the life of *Trypanosoma brucei* occurs in the tsetse-fly. The proboscis of the fly was examined at various intervals after feeding on an infected animal, and the following table shows the results of the observations :—

Hours	Hæmatozoa	Hours	Hæmatozoa
1.	A few seen wriggling vigorously.	23.	<i>Nil.</i>
2.	" " "	24.	One active hæmatozoon seen.
3.	" " "	25.	" " " "
4.	One active hæmatozoon seen.	27.	<i>Nil.</i>
5.	Two active hæmatozoa seen.	28.	One active hæmatozoon seen.
6.	<i>Nil.</i>	46.	" " " "
22.	One active hæmatozoon seen.	47-144.	<i>Nil.</i>

In the stomach of the tsetse-fly hæmatozoa were found alive as long as any vestige of blood remained in the viscus. On the sixth day, however, the observations were always negative. Motionless hæmatozoa were frequently observed in the intestine up to seventy-two hours after the flies had been fed, but no signs of life were noticed in the parasites. Droppings collected from flies fed regularly on dogs suffering from nagana when injected into healthy dogs gave negative results. Hundreds of flies were examined at various times after they had fed on an infected animal, but no appearances suggesting that hæmatozoa found their way out of the alimentary canal into surrounding tissues were observed. Minced-up flies which had fed on infected animals were also injected, but after the first half hour and up to the sixth day no signs of infection were seen in susceptible animals. Bruce wrote in 1903 : "It is a matter for regret that this experiment was stopped at six days and not tried at longer intervals," and in the light of later events it is most unfortunate that the experiment was not continued, as probably he would then have discovered that a developmental cycle does occur in the body of the tsetse-fly,

At this time Bruce wrote : "I must leave this subject in its present unsatisfactory condition with the hope that some future

observer may be able to throw more light on it. The most satisfactory solution would be the discovery of some metamorphosis of the trypanosoma within the fly such as occurs in the mosquito in malaria."

The problem has partially been solved by Kleine, who in Kirugu, on December 28th, 1908, made an experiment which seems to prove that transmission occurs in the case of *T. brucei* and *G. palpalis*, probably after a developmental cycle. As nagana did not exist in the Kirugu district some sheep and a mule were brought from a place seven days' march away; these animals had been naturally infected by the bite of *G. morsitans*. Tsetse-flies (*G. palpalis*) caught in the Mori river were fed for three days on these animals, and daily from the fourth to the seventeenth day on a fresh, healthy animal.

From the eighteenth to the twenty-fourth day the flies were fed on a healthy sheep (No. 30) and from the twenty-fifth to the thirty-ninth day on a healthy ox (No. 2). The blood of all the animals was frequently examined, but no parasites were found until the twelfth day after the flies had been placed on ox No. 2, when many trypanosomes were observed in its blood. Sheep No. 30 was then examined and was also found to be infected. All the other animals remained sound.

This experiment shows that after ingesting blood containing trypanosomes the flies remained powerless to produce infection for many days, and then infected a sheep and an ox.

Kleine continued his feeding experiments, and from the fortieth to the fifty-third day fed the flies on two goats, two sheep, and two calves: all the animals became infected. The incubation period was noted to be short, and probably related to the number of bites; it varied from eight and seven days in the goats, to five days in one calf, and five days in one sheep. The goats and sheep were infected without any difficulty, and Kleine thinks that in fly regions these animals, especially goats, must play a part as parasite carriers. Kleine also points out that if *G. palpalis* can transmit *T. brucei* it is possible that *G. morsitans* may transmit *T. gambiense*.

At a meeting of the Royal Society held on May 6th it was announced that a letter had been received on April 30th, 1909, from Sir David Bruce, dated Mpumu, Chagwe, Uganda, April 3rd, stating that the Sleeping Sickness Commission "had repeated Dr. Kleine's experiments with *T. gambiense* and *G. palpalis*, also with a trypanosome of the *dimorphon* type and the same tsetse-flies,

and found the flies infective after sixteen, nineteen, and twenty-two days."

It now appears possible that *T. gambiense* undergoes a cycle of development in *G. palpalis*, and we hope the Commission will be able to work out the exact changes which the trypanosome undergoes in the body of the tsetse-fly during the latent period, and ascertain how the infection is produced when the flies, in an infective stage, bite a susceptible animal: an exceedingly difficult investigation upon which many workers have been engaged for some years. It will be remembered that in an article on the transmission of tick fever, published in the February number of this Journal, Lieutenant-Colonel Leishman showed it was possible that the natural infection of tick-bite occurs, not as usually supposed,\* by the inoculation of unaltered spirochetes from the salivary glands, but through the agency of minute chromatin granules, which he considered to be derived from the spirochetes. The granules may either be regurgitated from the intestinal sac or passed in the Malpighian secretion, which is voided by some ticks when gorging. In the latter case such granules might readily gain entrance into the new host through the wound inflicted by the tick's bite. Leishman's observations are of great interest in view of the feeding experiments made by Kleine and by the Sleeping Sickness Commission now working in Uganda. It may be that bodies of a similar nature will be found to act as the direct infecting agent in the case of *G. palpalis*; the prolonged infectivity of this fly renders it certain that resisting bodies are formed and opens up the possibility of hereditary transmission.

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## United Services Medical Society.

### THE PREPARATION OF ANTI-TYPHOID VACCINE.

BY MAJOR H. W. GRATTAN AND CAPTAIN A. L. WEBB.

*Royal Army Medical Corps.*

HAVING been asked by the Secretary of the United Services Medical Society to read a paper on the subject of anti-typhoid vaccine, we thought we could not do better than give a short account of the present method of the preparation of this vaccine, and at the same time demonstrate the technique.

The whole of the anti-typhoid vaccine for the use of the British Army, both at home and abroad, is made in the Pathological Department of the Royal Army Medical College, under the supervision of Brevet-Lieutenant-Colonel W. B. Leishman.

A separate room is set apart for this purpose, and is used solely for the preparation of vaccine.

In order that you may follow more readily the various steps of the technique, we have drawn these up in tabular form on Table I.

The vaccine consists of a sterilised broth culture of the typhoid bacillus. The broth is ordinary nutrient broth brought to a reaction of + 10 (Eyre's scale). It is sterilised in the autoclave for a minimum period of three-quarters of an hour at 120° C. After cooling overnight it is incubated for forty-eight hours at 37° C., and then kept for two or three days at room temperature in the dark to prove its sterility. The broth is not sterilised in bulk but in flasks containing not more than 300 cc., as it is much easier to raise the temperature of a large quantity of fluid by distributing it in a number of flasks instead of placing it in one large vessel.

The purity of the culture is verified by plating, by titration with an anti-typhoid serum, by direct microscopical examination, and by cultural tests. The flasks are then inoculated and incubated for forty-eight hours at 37° C., and are placed in a horizontal position in the incubator. A dense growth of typhoid is obtained with the flasks in this position, owing to the fact that the typhoid bacillus grows more readily in the presence of an abundant supply of oxygen.

All the apparatus, with the exception of the bottles, is sterilised in the autoclave for three-quarters of an hour at 120° C. The bottles are sterilised by dry heat.

The contents of a series of flasks are then mixed and measured in a graduated jar; a batch of culture as a rule consists of about 4 litres before it is diluted. Measured volumes of culture are then run off into suitable flasks by means of "two way tubes." These tubes are then removed, and samples of the growth taken and tested for purity. This precaution is necessary in the preparation of all vaccines, but more especially so when a large quantity is prepared from many flasks.

The flasks are closed with their original plugs, which are then covered with waxed paper. This is perforated in order that an even pressure may be maintained, thus ensuring that the temperature of the culture will correspond with the control flask in the bath. The flasks are then placed in a water-bath at a temperature of 45° C. A thermometer placed in the control flask will enable one to ascertain the exact temperature of the culture.

The bath is kept at a temperature of 45° C. for half an hour to allow the temperature of the culture to rise to that of the bath. The temperature of the whole is then gradually raised until the thermometer inside the control flask stands at 53° C. After an hour and ten minutes at 53° C., during which time the flasks are repeatedly shaken, they are taken out of the bath and cooled down; the reason for cooling is that we have found by experiment that the potency of the culture is to a large extent destroyed if the antiseptic is added when the culture is hot.

The next step is to test the purity of the samples which were taken after the culture was mixed. The strength of the culture is then estimated by the "counting method." The technique is as follows: A small pipette is taken and a mark made at a convenient distance from the end; blood is then drawn up to the mark, and this volume of blood is washed out into citrate solution in a small glass capsule. After centrifuging, the supernatant clear fluid is pipetted off, the remaining cells are then twice washed with normal saline, and diluted with a small quantity of this fluid. The culture is then taken up to the same mark in the pipette used for taking the blood, and this is well mixed with the washed cells and saline. Wet film preparations are then made by placing small drops of the preparation on clean slides, dropping cover-glasses on, and ringing them with vaseline.

A series of successive "fields" are passed in view by means of a mechanical stage, and in order to avoid eye-strain, the field is narrowed by means of two glass filaments fixed on a disc which is dropped into the eye-piece of the microscope.

The number of bacilli and red cells are noted in each field, and not less than one hundred fields, or a thousand red cells, are counted. The calculation is based on the fact that there are 5,000 million red cells in 1 cc. of blood, and by rule of three we can estimate the number of bacilli in 1 cc. of culture, because we are comparing an equal quantity of a culture of unknown strength with an equal quantity of blood of a known strength. For example, if our count gave 1,500 red cells and 300 bacilli, then the strength of the vaccine would be 1,000 million per cc.

After the culture has cooled down, samples are again taken to see if the bacilli have been killed by the heating.

The preservative, which is 0.25 per cent. pure lysol, is now added in the form of a 10 per cent. solution in distilled water.

Two way tubes are then fitted to the flasks, and the rubber corks and tops of the flasks sealed with wax.

As it has been thought advisable to have a vaccine of a standard strength, and at the same time have the dose in a convenient form, the strength has been fixed at 1,000 million per cc.; so in cultures stronger than this, diluting fluid is added in sufficient quantity to reduce it to standard strength. The diluting fluid consists of sterile broth + 0.25 per cent. lysol. The following day the diluted vaccine is tested for sterility. After a minimum period of five days, the tests proving sterile, the vaccine is bottled. The technique of bottling is as follows: The glass guard and pipette are connected to one limb of the two way tube by means of rubber and glass connections; by the aid of a hand blower the operator can maintain a constant pressure in the flask, and a suitable flow of vaccine through the pipette. As each bottle is filled it is sealed by an assistant.

On a subsequent date certain bottles are tested for sterility, two broth tubes and an agar slope are inoculated from each bottle, and aerobic and anaerobic cultures made. After a minimum period of five days' incubation, the tests proving sterile, the vaccine is passed as fit for issue. It is labelled with its serial number, the date on which its sterility was verified, the dose in minims and cc., and the date after which it must not be used, *i.e.*, three months from the date of manufacture. It has been found by experiment that the vaccine deteriorates with age.

Copies of instructions containing an account of how to deal with the vaccine and what symptoms may be expected after its use are sent with each batch. The dose given is 500 million, followed after an interval of ten days by a second dose of 1,000 million.

The vaccine is given by subcutaneous injection; a convenient spot for the inoculation is the outer surface of the arm on a level with the insertion of the deltoid.

The clinical symptoms which result from anti-typhoid inoculations are subject to considerable individual variations. They may be divided into constitutional and local.

(1) *Constitutional*.—Some degree of *malaise* may be expected in every case. In a small percentage of cases there may be a tendency to faintness and occasionally a definite rigor. These symptoms may be expected between the first and sixth hour. When they are at all severe, it is the rule for them to come on before the expiration of the third hour. These preliminary symptoms are followed by a certain amount of fever. The average temperature which is attained is about  $101^{\circ}$  F.; in exceptional cases the temperature may rise as high as  $103^{\circ}$  F. The fever generally passes off completely at the end of eighteen to twenty-four hours, but in exceptional cases it may persist for another twenty-four hours.

(2) *Local Symptoms*.—In every case a certain amount of local tenderness will develop. This will generally begin to make itself felt about five to six hours after the inoculation. Somewhat later a red blush will appear around the site of inoculation. The local tenderness will be at its worst in about eighteen hours. In many cases the skin will then be red over an area of 4 to 5 inches square, and lines of injected lymphatics will sometimes be traceable radiating from the site of inoculation. There may, in addition, be slight tenderness in the armpit. These local symptoms will have practically passed away after the expiration of forty-eight hours.

*Results*.—The most recent statistics published on the subject are to be found in the February number of the JOURNAL OF THE ROYAL ARMY MEDICAL CORPS, in a paper by Brevet-Lieutenant-Colonel W. B. Leishman.

The total strength of the sixteen units under observation was 12,083; of these 5,473 were inoculated, amongst whom twenty-one cases of enteric occurred with two deaths. The remaining 6,610 non-inoculated men served as a control; amongst these occurred no less than 187 cases of enteric with twenty-six deaths.

The case incidence per 1,000 amongst the "exposed" units, *i.e.*, in which cases of enteric had occurred, was 6.6 amongst the inoculated, and 39.5 amongst the non-inoculated.

Still more striking results are shown by omitting the Royal Fusiliers (the unit inoculated with the old vaccine), the case incidence per 1,000 being 3.7 amongst the inoculated and 32.8 amongst

the non-inoculated. The old vaccine was heated to 62° C., which was found to have a deleterious effect on its immunising properties.

The comparison of these results with former statistics on the protective effect of the old vaccine seems to amply confirm the experimental findings, that an over-heated vaccine, a vaccine to which an antiseptic has been added when hot, or a vaccine which has been kept for more than three months, is very much reduced in efficacy, for whereas formerly the advantage in favour of the inoculated worked out something like two and a half to one, with the present methods the advantage is six or seven to one.

The amount of vaccine issued during the last twelve months was 40,000 double doses.

TABLE I.

## ROUTINE STEPS IN THE PREPARATION OF ANTI-TYPHOID VACCINE.

- (1) The purity of the culture is verified.
- (2) The sterility of the broth is verified.
- (3) The broth is inoculated.
- (4) Broth incubated for forty-eight hours at 37° C.
- (5) Mixed and measured.
- (6) Tested for purity after mixing.
- (7) Standardised.
- (8) Heated for an hour and ten minutes at 53° C.
- (9) Cooled.
- (10) Tested for sterility after heating.
- (11) Preservative added (0·25 per cent. lysol).
- (12) Diluted to standard strength.
- (13) Tested for sterility after dilution.
- (14) Bottled.
- (15) Tested for sterility after bottling.
- (16) Labelled.

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DISCUSSION.

Lieutenant-Colonel J. V. SALVAGE asked whether the small amount of antiseptic put in was added because it was considered definitely useful, or only as a concession to outside opinion.

Lieutenant-Colonel MACPHERSON in closing the proceedings remarked upon the fact that the interesting demonstration which had been given the society represented one of several methods of preparing material for prophylactic inoculations against enteric fever. These were the original inoculation material of Wright, the results of which gave rise to considerable statistical controversy, and the various forms of material employed

by the Germans, whose statistical results in South-West Africa were also scarcely so convincing as the figures recently supplied by Lieutenant-Colonel Leishman. He asked Major Grattan whether the difference in these results was due to a difference in the method of preparing the material, and if we were right in assuming that it was mainly due to the low temperature at which Leishman's material was sterilised.

Major GRATTAN replied, and said that the antiseptic was added to prevent the multiplication of any typhoid bacilli which might survive the temperature of 53° C. Although no growth could be obtained from a loopful of the culture after it had been heated, yet, if a larger amount (3 or 4 cc.) were tested, he found occasionally that a few typhoid bacilli survived the process of heating. The antiseptic was not added to the vaccine twice, but the fluid used for diluting contained 0.25 per cent. lysol, in order that the proportion of antiseptic in the vaccine should be constant, irrespective of the amount of dilution that was necessary to reduce the vaccine to standard strength. Continental workers heat their vaccines much longer and expose them to a much higher temperature.

An unanimous vote of thanks was accorded Major Grattan and Captain Webb on the proposal of the Chairman for their interesting demonstration.



## Clinical and other Notes.

### THE OPERATION FOR LIVER ABSCESS.

BY CAPTAIN A. J. HULL.  
*Royal Army Medical Corps.*

IN 1906 an article by the writer appeared in the *Journal* dealing with the treatment of liver abscess by drainage and irrigation through a small aperture. Experience of this method and the successful results obtained by Bier's methods of treating abscesses have caused the technique to be modified from time to time, but whilst certainty and simplicity have been added to the operation, the principle remains the same, that is, the cleansing and drainage of an abscess through a small aperture.

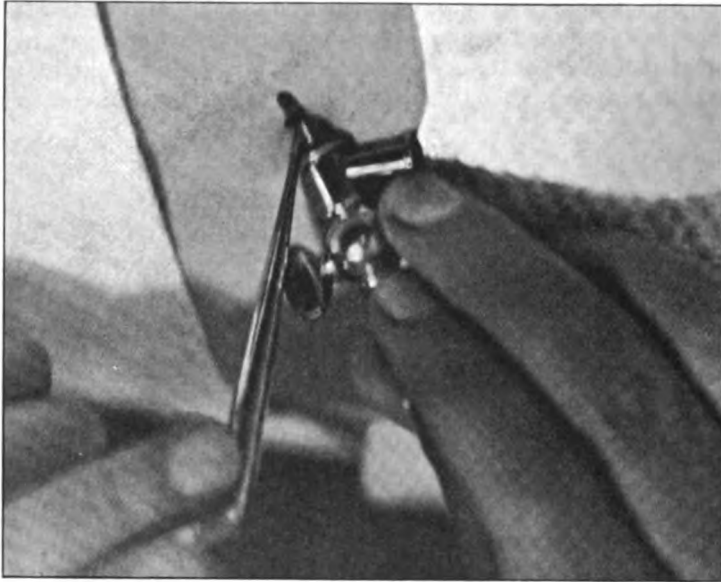


FIG. 1.—Guided by the aspirating needle a fine pair of probe-like forceps is inserted into the abscess cavity. The opening made by the needle is in this way dilated to admit a small catheter.

The operation is so simple that it may be described in a few words; a reference to the illustrations will make the technique clear :—

- (1) Pus is sought for in the usual way.
- (2) The aperture is dilated and a vulcanite catheter introduced.
- (3) The pus is aspirated and the cavity washed out.
- (4) Quinine may be introduced into the cavity.

(5) A Bier's bottle is applied, and the abscess cavity subjected to negative pressure.

In most cases it will be found necessary to remove the glass bottle on the third or fourth day. The tube is removed on the fourth day and the bottle re-applied.

The tube is placed in boiling oil before insertion; introduction is thus facilitated, and the oil, by preventing clotting, facilitates drainage. The bottle is sealed in position by collodion.

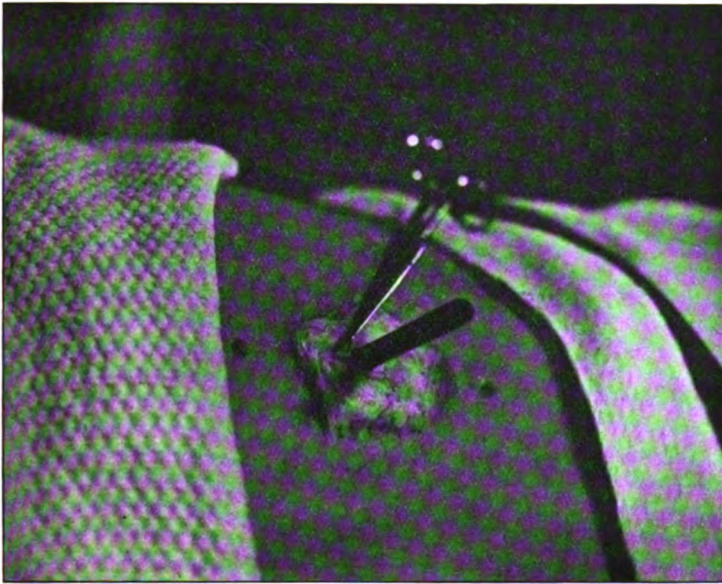


FIG. 2.—The tube, in this case a No. 12 vulcanite catheter, has been inserted, and a dressing of collodion and wool placed around it.

The advantages of this method are as follows :—

(1) The method of treatment by aspiration of pus and the injection of quinine has given such good results that any other mode of treatment may appear unnecessary. Many cases, however, are quite unsuited to this treatment, and some form of drainage is essential. The patient upon whom the procedure here described is performed is submitted to no more severe operation and runs no more risk of secondary infection than the patient who is merely aspirated, and in addition is placed in a more secure position.

(2) The negative pressure within the abscess cavity promotes rapid obliteration of the cavity.



- (3) If the abscesses be multiple, adjacent abscesses will open into the abscess cavity subjected to negative pressure.
- (4) Secondary infection is almost impossible.
- (5) Convalescence is greatly accelerated; in the last case operated upon by this method the patient was earning his living as a blacksmith within six weeks of the operation.

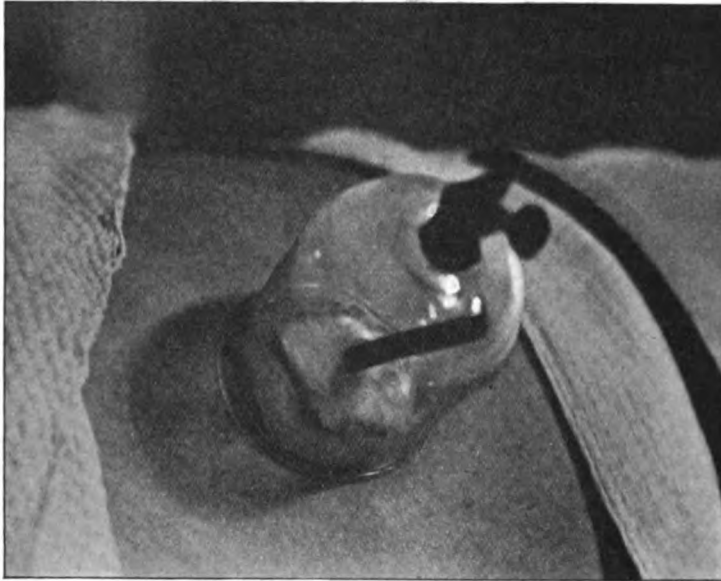


FIG. 3.—The operation has been completed and the Bier's bottle applied over the site of operation. The air in the bottle has been partially exhausted, subjecting the abscess cavity to negative pressure.

It may be asked, will thick, tenacious pus and sloughs drain through a small tube? The operator will be guided by the pus aspirated in selecting a tube of suitable calibre; in the majority of cases a No. 6 catheter will be found sufficiently large. By experiments on animals, the writer has found that the drainage through a No. 14 catheter with this apparatus is equal to the drainage through a 1 inch rubber drain with resection of rib, a mixture of treacle and sawdust being used in the experiment.





To illustrate paper "Compound Fracture of Third Metacarpal Bone of Right Hand." By Lieutenant J. B. G. MULLIGAN, R.A.M.C.

**COMPOUND FRACTURE OF THIRD METACARPAL BONE OF RIGHT HAND, THE RESULT OF A DIRECT PICK-STROKE.**By **LIEUTENANT J. B. G. MULLIGAN.***Royal Army Medical Corps.*

I THINK the following case may be of interest, as the fracture is rather a peculiar one.

On March 1st, 1909, Sapper S., Royal Engineers, aged 25, was admitted to Imtarfa Hospital with a small wound over the head of the third metacarpal bone of the right hand. This wound bled freely and his hand was much swollen. There was little or no pain, and when the wound was probed nothing abnormal could be detected. Sapper S. stated that: "while sapping down at Ghian Tuffieha camp a comrade accidentally drove a pick into his hand: at the time he was using a spade and his right hand was on the handle." The wound was dressed by a Royal Army Medical Corps orderly, but the bleeding becoming rather profuse, the man was sent to Imtarfa. As the man had received a severe blow and there was a good deal of bleeding the case was treated as one of fracture, although on careful examination no fracture could be detected. Major Master, R.A.M.C., kindly saw the case in consultation. The wound was cleaned, aseptic dressings were applied, and the hand being placed on a splint the arm was then put in a sling. The wound healed in seven days. Major Pollock, R.A.M.C., kindly X-rayed the case for me, and the accompanying X-ray photograph shows a small triangular piece chipped off just below the head of the metacarpal bone, also the place where the point of the pick entered. The man was discharged quite fit for duty on March 23rd, 1909. I am indebted to Major Master, for his assistance and permission to publish this case, and to Major Pollock for the excellent X-ray photograph.

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**A CASE OF MALIGNANT TUMOUR, TREATED BY TRYPSIN.**By **CAPTAIN F. W. LAMBELLE.***Royal Army Medical Corps.*

THE pathological changes in the tumour seem interesting enough to merit the publication of the following abridged notes:—

*History.*—In April, 1908, the patient, Walter G., aged 51, was first seen in consultation. He was then suffering from a small aneurysm of the left common carotid artery which had come on some three months previously. In November, 1908, he came to me a second time, and I found he had in the meanwhile developed a large tumour in the neck, the result of the X-ray treatment of the aneurysm which he had undergone between May and August, 1908.

*Condition before Treatment.*—Markedly debilitated in health and

depressed in spirits, appetite poor, nights sleepless. He had laryngeal stridor and a troublesome, brassy cough. The tumour extended across the median plane in front, distorting the trachea, behind it reached to within 2 inches of the vertebral spines. Above it extended to the angle of the mandible, and below to within  $1\frac{1}{2}$  inches of the clavicle. The skin over the growth was ulcerated over a small area the size of a sixpence.

*Clinical diagnosis* of lymphosarcoma of the superficial cervical glands was made, but the patient's condition forbade a general anæsthetic, so operation was contraindicated.

On November 5th the enzyme treatment of Beard was begun, 1,000 units of trypsin (Squire Standard III.) being injected daily, not into the growth, but subcutaneously into the flanks and buttocks.

On November 13th, 1908, the tumour showed signs of softening, and fluctuation was detected on its anterior aspect. Skin adjacent to tumour was congested.

On November 25th, 1908, the tumour was found to be softening all over, there was much local reaction in the adjacent tissues, and skin over it was intensely injected.

On November 30th, 1908, the tumour was soft and flaccid; individual glands could be felt.

On December 8th, 1908, the tumour was soft and dusky red, surrounded by an area exactly comparable to the "area of demarcation" seen in a gangrenous limb.

On December 15th, 1908, the tumour was sloughy in the centre and inclined to bleed. Trypsin was discontinued.

On December 28th, 1908, tumour exhibited all the signs of gangrene.

On January 6th, 1909, the tumour was cast off piecemeal through sloughy centre.

On January 20th, 1909, there was a slight oozing of blood through sloughing tumour.

On January 22nd, 1909, sudden and severe hæmorrhage occurred from tumour.

On January 30th, 1909, sloughing tumour was found to be separating, severe hæmorrhage set in, controlled with difficulty.

On February 5th, 1909, very severe and uncontrollable hæmorrhage set in from separating sloughy tumour.

On February 7th, 1909, the patient died from exhaustion after repeated hæmorrhages.

*Post-mortem Examination.*—The tumour cut like cartilage, having a dense fibrous structure, and an immense amount of purulent fluid escaped from the interstices of its fibrous stroma. Naked eye inspection of the tumour showed no gland tissue whatever. It was a dense fibrous stroma pent up with purulent fluid; the stroma had a very abundant blood supply, small arteries appearing as red spots in the scraped section.

A portion of the tumour was submitted to the Royal Army Medical College, and the following report was received :—

“The tissue consists of a fibrous stroma among which are embedded epithelial cells. In a great many cases the epithelial masses have apparently undergone necrosis and are infiltrated in the centre with hæmorrhage. The tumour appears to be a squamous-celled epithelioma.”

In the microscopical sections prepared the malignant cells were seen to have been destroyed by the treatment and were in process of removal by leucocytes. All that remained of the malignant cells were keratinous masses in which the individual cells were unrecognizable. The adjacent connective tissue reacted to these dead keratinous masses as to a foreign body and responded by the proliferation of fibroblasts and the formation of excess of fibrous tissue—scar tissue.

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#### SYNOPSIS OF OPERATIONS DURING THE YEAR 1908 AT THE CAMBRIDGE HOSPITAL, ALDERSHOT.

BY CAPTAIN J. G. CHURTON.

*Royal Army Medical Corps.*

*Operations on Tumours.*—Several non-malignant tumours, such as lipomata, fibromata, angiomata, and papillomata, were excised

*Operations on Cysts.*—A patient with hydatid cysts in the spleen and liver was operated upon. The cyst in the spleen was about the size of a child's head; it was cut down upon through the abdominal wall and aspirated, then drawn up into the wound and incised, the lining membrane being removed; finally the parietal peritoneum, together with the margins of the opening in the cyst, were stitched to the skin, a drainage tube being inserted. The cyst in the liver, which was considerably smaller than the one in the spleen, was incised and drained. The patient did very well.

*Excavation of Abscesses.*—Amongst these were two cases of liver abscess. One was a small superficial abscess in the left lobe, in a patient who had been recently invalided home from India for hepatitis, probably the result of malaria and alcohol, there being no history of dysentery. The abscess was incised and drained with satisfactory results; the pus was found to be sterile. The other case was one of multiple abscesses following dysentery, operated upon by Captain Greenwood, R.A.M.C. The patient eventually died of septicæmia.

Two chronic tuberculous abscesses were incised, scraped, and stitched up, small drains being removed after forty-eight hours. The abscesses healed by first intention.

*Removal of Foreign Bodies.*—Lieutenant Heslop, R.A.M.C., after localising with the X-rays, successfully removed a small revolver bullet from the thigh of a patient.

*Operations on Veins.*—Eighteen cases of varicose veins of the legs were operated upon, excision of the veins being performed. In only one case was it thought necessary to do Trendelenburg's operation, this was done in addition to excision of the enlarged veins lower down. All the cases did well.

*Operations on Nerves.*—An operation was performed on a patient who for a considerable period had complained of persistent pain in the neighbourhood of a scar, resulting from an operation for varicocoele. A piece of the ilio-inguinal nerve was excised with complete success.

*Operations on the Skin and Subcutaneous Tissues.*—These were four cases of skin grafting, all operated on by the Thiersch method.

*Operations on Bones.*—Wiring of fractures: This was done in two oblique fractures of the tibia and fibula, and in two oblique fractures of the humerus, it being impossible to reduce the displacement satisfactorily. A case of transverse fracture of the patella, and two cases of fracture of the olecranon process of the ulna, where there was considerable separation of the fragments, were also operated on.

Four cases of osteotomy for hallux valgus, in which a sufficient wedge from the metatarsal bone just behind the joint was removed.

A case of partial excision of the ankle-joint for tubercular disease which necessitated removal of the whole of the astragalus and part of the os calcis, was very successful. The wound healed by first intention; and though it was necessary to invalid the patient out of the Service, he left hospital with an extremely useful joint, apparently quite sound, and with very fair movement.

Removal of the internal semilunar cartilage was performed in five cases, the patients being unable to perform their duties, owing to the frequent locking and subsequent synovitis of the knee-joint. In two cases the cartilage was found to be partially split; in one a fold of synovial membrane was also removed. All the patients ultimately did well.

Loose bodies in joints: A smooth, rounded mass of articular cartilage was removed from the knee-joint of a patient.

Chronic villous synovitis — lipoma arborescens — was operated upon, the villi being as far as possible clipped away. The patient is at present on sick furlough.

*Operations on Muscles, Tendons, and Fascia.*—These included operative treatment on a number of cases of hammer-toe, in which tenotomy of the lateral ligaments, the glenoid ligaments, and the long flexor tendon, together with forcible hyperextension, was undertaken. This method of treatment proved very successful.

*Amputations.*—Sir H. Howse's two-stage modification of Furneaux Jordan's hip-joint amputation was undertaken in a case of extensive tubercular disease of the hip-joint with numerous sinuses; the patient, however, died of shock after the second operation.

*Operations on the Eyeball.*—In two cases excision of the eyeball was performed; one case on account of a septic wound with commencing iridocyclitis; the other for a foreign body, a piece of brass from a blank cartridge which had exploded in the fire and had penetrated the cornea and the lens, and was partially protruding into the posterior chamber. Both cases did well.

*Operations on the Ear.*—Stake's antrectomy was performed on three occasions; two have been satisfactory, the third, which was done quite recently, is still under treatment and progressing well. One case of antrum disease in which an abscess over the mastoid was incised and drained ended fatally, the patient refusing to have a second operation. In this case the pus not only extended to the surface, but also made its way inwards, giving rise to an abscess in the temporo-sphenoidal lobe of the brain.

*Operations on the Larynx and Trachea.*—Tracheotomy was performed in a case of cut throat; the patient had incised his larynx in two different places. After the tracheotomy tube had been inserted the wounds in the larynx were sutured together. The tube was removed on the fifth day, and by the fourteenth everything had healed up.

*Operations on the Thorax.*—One case of empyema was opened and drained, portions of two ribs being removed, and though convalescence was prolonged, the patient ultimately made a good recovery.

*Operations on the Abdomen.*—Forty-seven cases have been operated upon for the radical cure of hernia; these include one umbilical, one double inguinal, two cases which had previously been operated upon but recurred, one nine months, the other twelve months after the original operation; the remaining cases were all inguinal and by far the larger portion right-sided. The operation performed in the latter cases was a modified Bassini's. All the results so far have been satisfactory.

There were twenty-two operations for appendicitis; in five of these the appendix was removed during the quiescent period. One death from diffuse peritonitis, possibly due to infection during the cutting off of the appendix, resulted. Since then I have invariably used the cautery for this purpose and believe it to be the safest method. Three cases were operated upon within forty-eight hours of the attack, the appendix in each being removed; all did well. Eleven were operated upon at different stages during the attack—duration more than forty-eight hours—in all pus was present. The appendix was removed in six cases only, all were drained. One death resulted from multiple abscesses of the liver from pylophlebitis secondary to the appendicitis. One case operated upon within six hours of the onset of pain was found to have diffuse peritonitis, the result of perforation of the appendix. Though still in hospital the patient is progressing favourably.

Abdominal section for aseptic variety of tubercular peritonitis was performed on two occasions; in both cases the patients apparently made



complete and rapid recoveries. One of these cases was thought to be suffering from appendicitis, and at the operation the tubercles were seen to be entirely confined to the appendix, the cæcum, and the adjoining ilium.

A case of stricture of the pylorus due to adhesions was successfully operated upon, the pylorus being freed. Nephro-lithotomy for renal calculus was performed in one case, a number of small stones being removed from the pelvis of the kidney. The patient is still in hospital, but a small sinus now only remains.

*Operations on the Rectum and Anus.*—Twenty-two cases of piles were operated upon, the method of procedure being ligature and excision, in all but two cases Whitehead's operation was performed. All were satisfactory. Five cases of fistula were incised, scraped, and packed, with good results. Two cases of fissure were incised and did well. One case of prolapse of the rectum was treated by complete removal of the prolapse, with satisfactory result.

*Operations on the Male Generative Organs.*—Twenty-two cases of varicocele were operated upon. In sixteen the usual procedure of excising a portion of the veins and suturing of the divided ends, the incision being placed over the external abdominal ring, was followed. Some of the cases were not altogether satisfactory, the patients returning again after a variable time, to say they had some recurrence of the pain; accordingly, in the remaining six I operated with the view of not only reducing the venous congestion, but of giving more support to the testicle, which I take to be one of the principal causes of the pain and discomfort. In short, I combined the operation mentioned above with that of excision of a portion of the skin on the affected side of the scrotum, and converted a longitudinal incision of the underlying tissues into a transverse one, the divided edges of the skin being finally brought together and sutured. So far these cases have all done well.

Fifteen cases of hydrocele of the tunica vaginalis, two of which followed operations for hernia, were operated upon, excision of the parietal layer of the sac being effected in each case. All were successful.

Castration was performed on two occasions, in one case for early tuberculosis of the epididymis, in the other for a painful retained testicle. Both were successful.

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#### A NOTE ON THE INCINERATION OF FÆCES IN INDIA.

BY CAPTAIN A. H. SAFFORD.

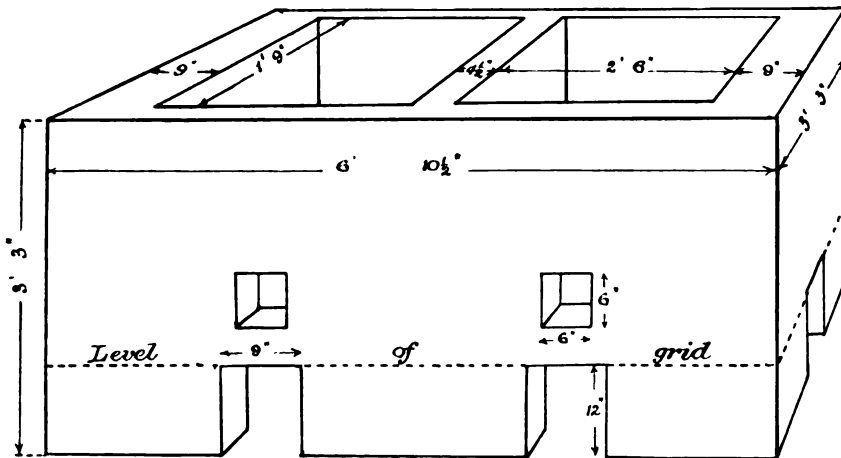
*Royal Army Medical Corps.*

THE accompanying diagram illustrates a simple method of incineration which has lately been adopted at Allahabad.

Colonel L. E. Anderson, Principal Medical Officer, and Lieutenant-Colonel Lynden Bell, Senior Medical Officer, having made some experi-

ments on the destruction of fæces by incineration, using dead leaves as fuel, an experimental incinerator was built behind one of the latrines in the lines of the 1st Middlesex Regiment. Advantage was taken of the regiment being on manœuvres so that the incinerator could be built in a central position in the barracks and the exact number of men using the latrine could be known, only the band and details being left in barracks.

Serjeant Hill, M.W.D., constructed the first incinerator from my design. It was built of bricks on a cement base (where an old ash bin already existed), 4 feet square, with a grid made of hoop iron 1 foot above the ground level, spaces being left at the base for draught, and just above the grid for raking purposes. Into this dead leaves and dry refuse from the coffee shop, &c., were placed, and, having been set fire to, the contents of the pans were emptied on and were quickly destroyed. The number of



men using this latrine was 92. It was soon found that the incinerator was unnecessarily large, so that a second one was constructed behind a latrine which was to be used by a draft of men just arrived from England. The draft consisted of 161 men, and no others were allowed to use this latrine.

The incinerator was divided into two compartments, each 2 feet 6 inches square, and it has since been found that one of these compartments was sufficiently large to destroy the fæces of all these men for one day, so that they were used in turn. Each pan in the latrine is half-filled with leaves after being cleaned, and is then replaced in the latrine; the leaves absorb the urine, hasten incineration, and keep the pan from being soiled.

The question of fuel has always been the chief difficulty in this matter, but in stations such as this, in which dead leaves are plentiful during the greater part of the year, this difficulty seems to have been overcome.

It is proposed to cover these incinerators during the wet weather with a galvanised iron cover, and to store the leaves during the dry season as a reserve for the rains. It has been found that very little smoke arises during the process, and what little there is, is quite inoffensive.

The advantages obtained by having an incinerator behind each latrine are that there is no storing of refuse during the day, as the contents of each pan are immediately emptied on to the fire and destroyed, there is no carriage of faecal matter through the lines, and, if the urine can be dealt with in the same manner, the trenching grounds can be done away with, and there will consequently be a considerable saving of labour and expense.

The cost of construction only amounts to about Rs. 3 to Rs. 5 for each incinerator.

Those already constructed are very primitive, and are only experimental, so that, no doubt, they will be greatly improved upon when the scheme is further developed. It yet remains to be seen whether sufficient fuel can be stored to supply the demand during the rains.

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#### SPECIFICATION OF RATION VEHICLE, DESIGN "B."

By MAJOR McMUNN.

*Royal Army Medical Corps.*

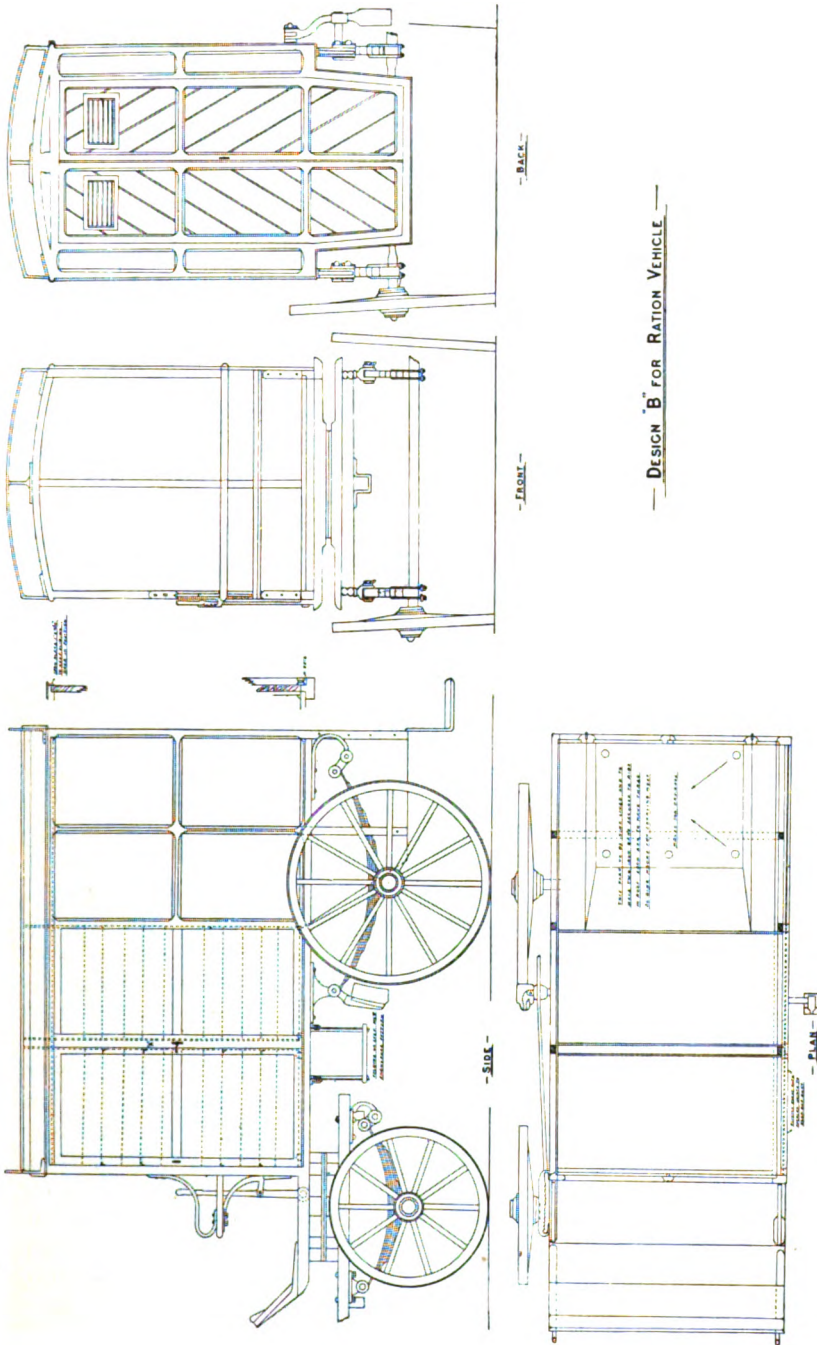
THIS vehicle is designed to carry bread, meat, and other rations.

The body is divided into three compartments by two upright partitions, marked A-A on drawing; the first two for bread, and rear one for meat. Access to the bread compartment is from the near side and to the one for meat from the rear.

A well is built in the rear portion, so that should it be necessary to carry large pieces of meat, a man can walk in with it. The meat will be carried on hooks, as described in the specifications. Bread is carried on sliding trays, which can easily be removed for cleaning. A guard rail is fixed round the top of the wagon, so that vegetables, flour or other stores can be carried, if required. The roof is made sufficiently strong to stand any reasonable weight. It is to be covered with canvas, and to receive a good coating of white lead just previous to the canvas being stretched out.

The whole of the rear portion of vehicle is to be lined with zinc, and to be fitted with two long iron bars carried in brackets secured to ribs in the roof and sides, each rod to be fitted with three large hooks for carrying meat; bars and hooks to be removable for cleaning purposes.

Ventilation in the back portion is provided by louvres in the doors, and an opening of 1 inch between the top rail and the roof, also over the door and rear; all openings must be covered on inside with fine gauze wire.



Five holes, 2 inches in diameter, are provided in the bottom for drainage and cleansing purposes. Entrance to the back is by two doors, each hinged with three brass butt hinges, and secured by bolts actuated by one lever of approved fastening or lock. A step, made of hickory, supported by two iron brackets,  $1\frac{1}{2}$  inches by  $\frac{1}{2}$  inch, as shown in the drawing, is to be provided.

Each compartment is fitted with six trays, supported on  $\frac{3}{4}$  inch by  $\frac{1}{4}$  inch angle iron, fixed to the front, and with partition boards about 8 inches apart to carry bread. The trays are not more than 4 inches deep, to allow of two being put in one division when emptying.

The entrance to the front is by two sliding doors on near side. The doors are so made that when closed the two doors overlap to keep out dust. The frame of the overlap part is 3 inches wide. Each door is to be fitted with two groove rollers on the bottom, and a guide on the top, and is to slide on a rail to suit grooved rollers, the rail being 1 inch wide, with a rib of  $\frac{3}{4}$  inch. Each door is also fitted with a handle and catch to secure it to near the front corner upright, and a catch to secure the doors together when closed.

A folding step, similar to the rear step on ambulance Mk. V., is under the body (so as not to interfere with locking of the front wheel) to enable trays with bread to be withdrawn.

A seat is fitted in front, made of hickory, supported by iron brackets, and having side irons, as shown on the drawing, well bolted to the framing. There is a footboard supported by iron brackets, as shown in that view.

The vehicle can be fitted with a box under the driver's seat, if required, and a small hood to protect the driver during wet weather can easily be fitted if required.

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#### A CASE OF ERYSIPELAS OF THE HEAD AND FACE TREATED WITH ANTISTREPTOCOCCUS SERUM, ROYAL VICTORIA HOSPITAL, NETLEY.

BY LIEUTENANT H. V. B. BYATT.

*Royal Army Medical Corps.*

THE patient, aged 26, a driver in the Royal Horse Artillery, was transferred from the convalescent division, where he was awaiting discharge to duty, complaining of a sore throat.

When first seen on January 14th, the throat was red but not injected, and there was some redness over the bridge of the nose, starting, he stated, from a pimple. His temperature was  $103.6^{\circ}$  F., but there was no pain and no feeling of discomfort. On the following day the redness had spread on to both cheeks, and formed a "butterfly" patch somewhat resembling lupus erythematosus. The infiltration was very slight, and there was no pain or constitutional symptoms. The evening temperature

was 99° F. On January 16th the red area had spread still further, and the temperature was 102·8° F. This continued for the next two days.

When seen in the isolation hospital on January 18th there was a definite erysipelatous patch over the greater part of both cheeks and the bridge of the nose. The eyelids were swollen, and there was a definite edge of infiltration advancing upwards in the middle line of the forehead. The temperature was 102° F. A light but nourishing diet was ordered, and a mixture containing tinct. ferri perchlor.,  $\mathfrak{m}\mathfrak{x}\mathfrak{v}$ ., every three hours. A mixture of ichthyol 10 per cent. and glycerine was painted over the inflamed area, and the face covered with a lint mask.

When seen the following morning, January 19th, the patient complained of having had a very bad night, and of a severe headache. The condition of the face was unaltered, but the infiltration had encroached on the forehead, forming a large swelling in the middle line of about the size and shape of a penny bun, on which several large blebs, containing clear fluid, had formed. The temperature was 102·6° F., and there was considerable constitutional disturbance. At 10 a.m. 10 cc. of polyvalent antistreptococcus serum (Burroughs, Wellcome and Co.) were injected subcutaneously into the flank; the dose was repeated in the evening at 6.30 p.m., by which time the temperature had already fallen to 101·4° F.

Next morning the temperature had fallen to 99·8° F., and the headache and other constitutional symptoms had abated. The infiltrated area on the forehead had become limited, and the swelling had somewhat subsided. A further 10 cc. of antistreptococcus serum were injected, and in the evening the temperature was normal.

On January 21st, the tenth day of the disease, the temperature was normal, and practically all the swelling and infiltration had disappeared, except for some puffiness under the eyes. The patient stated that he felt quite well and wanted to get up. The ichthyol was replaced by boric ointment; he was put on ordinary diet, and made a rapid and uneventful recovery. The serum used was dated March, 1908, and at no time was there any sign of "serum disease," nor was there any albuminuria.

The results, which seem to be directly due to the serum, are :—

- (1) The instantaneous arrest of the spreading process.
- (2) The rapid fall of temperature, almost amounting to a crisis.
- (3) The rapid convalescence of the patient.

I am indebted to Lieutenant-Colonel R. R. H. Moore, R.A.M.C., for suggesting the treatment, and to Colonel T. P. Woodhouse, R.A.M.C., for permission to publish the notes of the case.

## Report.

### THIRD REPORT OF THE COMMITTEE ON PHYSIOLOGICAL EFFECTS OF FOOD, TRAINING AND CLOTHING ON THE SOLDIER.

(Continued from p. 681.)

#### APPENDICES.

##### APPENDIX I.

#### REPORT ON AN ANALYSIS OF TINNED MEATS AS SUPPLIED TO THE ARMY, BY MAJOR W. W. O. BEVERIDGE, D.S.O., R.A.M.C.

*General Remarks.*—The Director of Supplies was requested to supply for analysis samples of all the various kinds of tinned meats, such as are supplied to the troops, both under peace and active service conditions. Altogether twenty-six samples of different brands were received, being all that were obtainable from the Supply Reserve Depot at Woolwich. Among these were three samples of a consignment sent to Gibraltar and returned to Woolwich. It should be noted that many of these samples were those of former supplies, not now issued.

*Age of Samples.*—The samples differed considerably as to age, varying from a few months up to five and a half years since date of packing; the latter, a sample of roast mutton, was remarkably well preserved, and, as far as chemical examination showed, quite fit for consumption. Five of the samples analysed were specimens of the new American contract, packed in December, 1906 (Nos. in analyses 8A and 8B and 9, 9A and 9B). As will be remarked upon later, these tins, although only packed three months, when analysed, were very much blackened in the interior. These samples showed a high protein value, but in one the fat was remarkably deficient, only amounting to 5·37 per cent.

*Nature of Samples.*—The majority of the samples consisted of corned, cooked, compressed beef, which, as compared with the roast beef, was in appearance, taste and keeping properties, superior, although the samples contained considerable quantities of saltpetre or potassium nitrate derived from the pickle in process of manufacture.

The different brands were made up as follows :—

Corned beef .. .. .	19
Roast beef .. .. .	3
Corned mutton .. .. .	3
Roast mutton .. .. .	1
Total .. .. .	26

The three samples of corned mutton were, except for the coarseness of the meat, particularly good in taste, appearance, and keeping properties. The fat is not so much distributed amongst the meat as in the samples of beef, and would be more easily discarded by those who preferred less fat. Evidently corned mutton is not so generally used as corned beef.<sup>1</sup> It is an excellent preparation, and during the war in South Africa was looked upon as a welcome change, apart from the superior keeping properties it possesses.

*Roast Meats.*—The roast meats, as a rule, were less tasteful than the corned, and appeared to become dry more quickly on exposure to air from their containing a less amount of salts. They might be improved by the addition of more sodium chloride to make them more palatable.

*Condition of Samples.*—With one exception all the samples were sound. The exception was a sample of corned beef packed in 1904. It is understood that no contract for this meat was placed.

Three tins were bulged and contained a large quantity of stinking gas. The contents were putrid, and, as compared with the sound samples of the same meat, showed a marked increase of acidity, an increase of peptones and an absence of nitrates, which had evidently been reduced, as the sound tins contained as much as 1 gramme of  $\text{KNO}_3$  per tin. The only micro-organism obtainable was the *B. cadaveris*, which accounted for the excess of acidity. It will be remarked that tinned meats, unexposed to air, when putrefied, give a strongly acid reaction, and that any tests for putrefaction based on the reaction of ammonia will be of no value. Another of these tins showed a curious condition, for although there were no signs of any bulging whatever or the presence of gas, neither was there any rusting or apparent puncture of any kind, yet upon opening, about  $\frac{1}{2}$  inch of the meat on the top was putrid and smelling, the rest being sound enough. No living micro-organisms were obtainable by culture from any part of the tin.

This shows that "no bulging" cannot invariably be taken as a sign of sound contents, although such cases as this must be rare.

*The Quality of Samples.*—The quality of the samples, judged by the constituents, varied considerably. Even in individual tins of the same brand the separated constituents showed considerable variation. This principally consisted in the amount of fat present. In nearly all cases the fat appears to have been added at the discretion of the manufacturer, and in many it was excessive. This is done to lessen expense, the more fat in a tin, the greater saving to the maker. It is advisable to lay down a standard for fat.

*Amount of Fat advisable.*—Both from experience of the soldier's taste in this matter and from observations obtained on analysis, it is probably

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<sup>1</sup> The contract price of mutton per lb. tin is 6½d., whereas that of beef is 5d.



advisable that the amount of fat should total about 15 per cent. More than this makes the meat greasy and distasteful, and less than 10 per cent. gives an insufficient fuel value.

*Presence of Gristle, &c.*—Some of the samples contained a large amount of gristle and fascia; one, No. 21, a very bad preparation, had practically as much gristle in it as meat. This detracts materially from the value of the ration, and would be sufficient to condemn the sample.

*Trimethylamine.*—In one sample of corned mutton, trimethylamine was present. This is difficult to account for, unless it be due to the splitting up of xantho-creatinine ( $C_8H_{10}N_4O$ ) by the action of heat during the process of sterilisation; or it may have been derived from the fluid used in pickling.

*Effect of Nessler's Reagent.*—In every case a watery extract of the meat gave, on the addition of Nessler's reagent, a lemon yellow solution. On boiling, the yellow solution turns to olive green colour and then deposits a heavy leaden-coloured precipitate. It was found that the precipitate was due to the gelatine present. If a watery extract of meat be freed from gelatine, Nessler's solution added, and then boiled, no discoloration of the yellow solution occurs, and no precipitate is deposited.

A pure sample of gelatine, either from meat or that known as the "gold label," gives with Nessler a yellow solution, which on boiling turns olive green and deposits a heavy precipitate, leaving the solution again of a yellow colour. This reaction is sufficient to indicate the presence of gelatine in mixtures of foodstuffs. Nessler's solution also gives a dark-coloured solution with creatin and leucine. If to some of the meat in a test tube some 25 per cent. HCl solution *plus* a little solid p-dimethylamine-benzaldehyde be added and the mixture boiled, a violet solution results. This, if a 5 per cent. solution of  $KNO_2$  be added, changes to a deep green or blue. Gelatine gives no reaction with p-dimethylamine-benzaldehyde and is thus distinguished from the proteins. If the yellow colour with Nessler were due to  $NH_3$ , the reaction of the meat would be alkaline, but this is never the case. There is no free  $NH_3$  in the tins.

*Cause of Blown Tins.*—The question as to the reason why tins of meat after passing the tests applied by the makers, become suddenly blown after keeping months, or may be years, has never been satisfactorily explained. If due to minute punctures from rusting, damage, &c., allowing air to enter, one would suppose that the resulting gas of putrefaction would also escape, and blowing of the tin would not be apparent. Chemical change, giving rise to hydrogen, must be very rare, and in this case putrefaction would not be present. It is probable that spores of bacilli, such as *B. cadaveris*, were present in the meat at the time of packing. In those cases where tins have become blown after an interval of time, the heat of sterilisation has not been sufficient to penetrate the interior of the meat, so that as long as the meat is kept cool and

unexposed, it remains good, but on exposure to a sufficient heat, the retained spores rapidly develop. The test applied by the canner might not be of sufficient duration to enable the organism to form gas. (See Appendix III.)

I have noticed, and think it of some importance, that in most cases of putrefying tinned meats, the putrefaction has started from the interior, as shown by internal patches of putrefaction with distinct passages to the exterior, made by the gases evolved. Those cases where partial putrefaction has taken place are probably due to this cause, and as the putrefaction was found at the end of the tins, the tins may not have been sufficiently submerged at time of sterilisation, if this process was carried out by boiling. The variation of atmospheric pressure appears not to have any marked influence on the development of spores, and may be discarded.

*Indifferent Quality of Meat itself.*—One cannot help remarking on the very indifferent quality of the meat as a whole. This is chiefly evident in the exceeding coarseness of the fibre, especially in some of the American brands. In this country, at least, no one would ever dream of purchasing meat of this description, and when corned its coarseness is still more marked. It must also, to a great extent, be far more difficult to digest.

A brand of English prepared meat (Sample No. 1) was of much finer quality, although not a good sample owing to excess of moisture, and probable want of experience in the methods of preservation. A tinned meat, made in the British Islands from selected imported meat or animals, and prepared by the best methods, would meet all the requirements of a nearly perfect preserved ration. The change on active service, to not only a preserved ration, but one consisting of a meat quite unlike the meat the British soldier is accustomed to, is somewhat severe and leads to a natural distaste. It is a pity that the preserved meats for the soldiers' use cannot be manufactured under the direct supervision of the Supply Branch of the Army itself.

Two brands of meat, viz., a New Zealand and an Argentine brand, were a long way superior in all respects to any other brand examined, both as to the quality of the meat, the state of preservation, and the better tinning of the interior of the tin. Some of the Australian brands resemble the American in coarseness of the meat fibre.

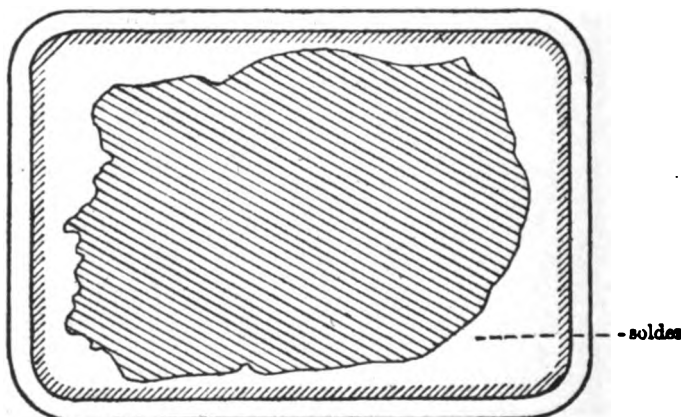
*Number of Samples sent.*—The number of tins sent for analysis amounted to eighty-seven, representing either six, or one tin, to each brand. Altogether ninety-eight analyses were required for each chemical constituent, besides separate analyses of nitrates, metals, &c.

*Preparation of Sample for Analysis.*—In analysing tinned meats there is some considerable difficulty in preparing the meat so as to obtain a sufficiently homogenous mass to work upon and a satisfactory average of the whole. It is not sufficient to take a slice of the contents in order to obtain anything like a fair sample.

The method adopted in this analysis was to pass the contents of the tins twice through a fine mincing machine, mix, then pound thoroughly in a mortar and again well mix. Even then the fat always showed considerable variation.

*Method of Analysis.*—In the case of a six-tin sample, three tins were treated together and three analyses made, the remaining three tins being analysed separately and an average of the whole struck. In the case of a one-tin sample, three separate analyses of the tin were made to obtain an average.

*The Condition of the Tins.*—With two exceptions the tins were sound, but some showed signs of age. The majority had paper labels, which for active service conditions are best avoided, as they retain moisture, ferment, and cause rusting of the tins.



BOTTOM OF TIN, SAMPLE No. 9, SHOWING AMOUNT OF SOLDER PRESENT. ACTUAL SIZE.

*External.*—The samples were all either painted or lacquered. A tin covered with a thick coat of paint is far preferable and stands rough usage better. Many of the samples were undated. The date of packing should invariably be stamped on the top of the tin itself. Every tin examined showed only one solder hole. Many of the tins showed internally a considerable amount of solder both at the ends and along the seams (*see diagram*). This conduces to the absorption of metals, chiefly tin and some zinc. The use of outside seams would obviate the danger. Occasionally drops of solder were found which had escaped from beneath the piece of tin-plate placed to prevent its entrance before the tin is finally soldered up.

*Interior.*—Blackening of the tin-lined interior was present in varying degrees in the majority of the tins, but in only one sample was there any sign of actual corrosion. (See Appendix IV.)

*Condition of the Contents.*—With the two exceptions alluded to, all the contents were sound, but they differed considerably in quality. If the meat is originally good and has been well packed and kept under proper conditions, there seems to be no reason why it should not remain good for many years. For instance, a sample of corned mutton (No. 13) packed in 1904 was as fresh and palatable as those packed in 1907. One sample packed in 1902 was also sound and quite palatable. In nearly all cases the meat fibre was very coarse. Many of the samples were blackened on the surface in patches from contact with the tin. These patches contained the metals, chiefly iron. In one case a sample of corned beef contained mutton fat.

*Moisture.*—The samples, as a whole, contained at least 50 per cent. of moisture. This is probably necessary, as a smaller amount makes the meat dry and unpalatable. A greater amount is not required, and causes a loss in nutrient value. One sample of English prepared meat contained as much as 67 per cent. of water, and in consequence was moist and flabby and had a protein value of only 16.48 per cent. Samples with moisture as low as 40 per cent. appeared particularly dry. One sample of Australian meat contained only 25 per cent. moisture, but had an excessive amount of fat.

*The Mineral Matter.*—This was highest in the corned meats, as would be expected.

*Ash.*—The ash was slate-grey, alkaline in reaction, and consisted largely of sodium chloride and phosphates. Samples of mutton contained as a rule a smaller percentage of mineral matter. A pinkish colour was observed in the ash of the putrid samples.

Some meats "ash" much more easily than others, and some are often very intractable. A white ash is generally impossible to obtain, without loss of chlorides. The higher percentage of salts found in canned meats makes them probably less nutritious than fresh meat. Corned meats contain considerable amounts of salt, derived from the pickling fluid in which they are placed prior to packing.

*The Acidity.*—The amount of acid present, calculated as lactic acid, was in every case below the maximum for fresh meat, the acidity of which varies, in sound samples, from 0.1 to 1 per cent. The highest acidity found was in the putrid sample, amounting to 1.62 per cent., whereas in a sound sample of the same brand the acidity was only 0.63 per cent. Every sample of meat examined gave an acid reaction, but on exposure to air at ordinary temperature they all became alkaline in about eighteen hours.

*The Total Nitrogen.*—The highest amount found was in Sample 8A, roast beef, 5.34 per cent., and the lowest 2.46 per cent. in Sample 17, corned beef. The total nitrogen was determined by the moist combustion process for the reason that this has been the method adopted in all published analyses, and so admits of comparison.

As will be shown later, every sample of corned meat examined contained a certain amount of nitrates, but as it would have served no purpose, in the present analyses, the modified Gunning process to include the N. of the nitrates was not employed; the amount of nitrates present was estimated separately. From the result of some experiments carried out, it appears probable that drying the meat before digestion with sulphuric acid causes a slight loss of nitrogen, and for this reason the samples, after weighing, were transferred directly to the digestion flask. As the proteins form the largest proportion of the total nitrogenous compounds present in meat, the usual factor  $N. \times 6.25$  was used to indicate the total protein present. It is probable that the protein ( $N. \times 6.25$ ) will not represent in every case an available amount of protein matter, as in most tins a certain amount will be indigestible.

*Protein.*—The highest amounts—33, 36, 33.06, and 32.75 per cent.—were found in the case of corned beef in samples representing the new contract with American firms. A sample of roast mutton contained as much as 32 per cent. The lowest percentage amounts were in Sample No. 17, being 14.63 per cent. (but in this case the fat was enormous, 57 per cent.), and in Sample No. 1, 16.4 per cent. There appears to be no difference in the protein value of corned and roast meats. As compared with fresh meat, the protein value is, on an average, considerably higher, owing to concentration and compression. The statement made by some of the manufacturers, that the contents of the tin represented double the quantity of cooked meat, could only refer to the bulk and was absolutely untrue.

*The Fat.*—In most of the samples examined the amount of fat found was very high, but the average worked out, in the case of corned beef, to 17.74 per cent., roast beef 12.99 per cent., and corned mutton 28.12 per cent. In one sample of corned beef the fat averaged 57 per cent., and the meat was in a repulsive oily condition. The fat is very unequally distributed in the meat; this may be from its being added separately at the discretion of the canner. As a rule much is found on the top when the tin is opened. This is due to the melted fat rising during sterilisation. As this fat is generally removed before the meat is eaten, it serves no useful purpose. In some cases the fat was in a semi-solid condition. In other samples the fat had become more or less crystalline and felt gritty to the touch.

*The Nitrates of Corned Meats.*—It was found that every sample of corned meat that was distinctly red in colour contained saltpetre or nitrate of potassium. The red colour of the meat is certainly due to the presence of nitrates, which the meat absorbs from the pickling fluid which contains them, chiefly in the form of saltpetre. Two samples of corned meat, which were brown in colour, contained no trace of nitrate, and probably these meats had been pickled in a fluid containing sodium chloride only. One sample of "roast beef," red in colour, contained 0.24 grammes of  $KNO_3$  in a tin, and should have been described as corned beef.

*Cause of Red Colour in Meat.*—Santorini came to the conclusion that the addition of nitre had no effect in colouring cooked meat red, but this cannot be correct. On the other hand, roast canned meats which also are brown in colour, but never red, contain no trace of a nitrate or nitrite. The red colour of corned meats rapidly lessens on exposure to the air, but does not entirely disappear until decomposition takes place. If the meat is placed in a bottle, after exposure to air, the red colour reappears where the meat is in close contact with the glass.

The red colour disappears on the application of heat. A watery solution heated to 100° C. for one hour turns brown. In putrefying samples the red colour also disappears, and nitrates can no longer be detected owing to their reduction. When meat that has turned brownish by exposure to air or heat is examined for nitrates, it will be found that the amount has not diminished, or at least not to any appreciable extent, so that the red colour is not due to some stable chemical combination of the nitrate present. As pointed out by Dr. J. S. Haldane,<sup>1</sup> the red colour of cooked salt meat is due to the presence of NO-hæmochromogen, which is produced by the decomposition by heat of nitric oxide hæmoglobin. For this nitric oxide hæmoglobin to be formed a nitrite must be present, and it is presumed that a reduction of the nitrate occurs previous to the heating process. It is extremely difficult to extract the red colouring matter from corned meats, as it is insoluble in water. Petroleum ether in some cases extracts the colour to a pinkish hue, and alcohol also extracts a small amount after kneading. An acid glycerine solution or amyl alcohol acts fairly well, but a more satisfactory method needs to be determined. The solution, however obtained, gives the spectrum of NO-hæmochromogen.

*Nitrite.*—In none of the samples of canned meats examined was there any trace of nitrite. It was found in traces in a sample which had stood exposed to the air of the laboratory for twenty-four hours.

Mitchell<sup>2</sup> has pointed out that "as the red colour of fresh meat is dependent upon the amount of hæmoglobin present, an approximate ratio may often be observed between the colour and the amount of iron (chiefly derived from hæmoglobin) in the ash, left on calcining the flesh." This cannot hold good in the case of tinned meats, as the iron found is greatly in excess of that derived from the hæmoglobin, being taken up from the tin itself.

*Amount of KNO<sub>3</sub> found.*—The amount of nitrate calculated as KNO<sub>3</sub> found in the samples examined (13) varied between 0.014 and 0.290 gramme per cent., amounting to from 0.104 to 2.137 grammes in a tin, according to the weight of the contents. Whatever the strength of the

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<sup>1</sup> *Journal of Hygiene*, vol. i., No. 1, January, 1901.

<sup>2</sup> "Flesh Foods," C. Ainsworth Mitchell, 1900.

pickling fluid used, it evidently bears no definite relation to the amount absorbed; the average amount absorbed would seem to be somewhere about 0.133 gramme per cent., equivalent to 9.3 grains of potassium nitrate per pound of meat. One sample contained 20 grains per pound.

The medicinal dose laid down in the Pharmacopœia is from 5 to 20 grains, or  $\frac{1}{3}$  to  $1\frac{1}{3}$  grammes, so that a man eating a pound of corned meat, although not exceeding the maximum, may be taking a fairly large dose. Next to chlorate of potassium, nitrate of potassium is the most poisonous of the potassium salts (Hare). Wynter Blyth states the poisonous dose to be from 15 to 20 grammes, and that from 3 to 5 grammes produce unpleasant results. The symptoms attributed to large doses of nitrate of potassium are nausea, vomiting and diarrhœa. Owing to the basic radical, potassium, it acts also as a cardiac depressant, with irregularity and slowing of the pulse. Weakness, cold sweats, cramps, and convulsions precede death. Ringer states "that when taken for some time in moderate doses, they considerably disorder digestion, producing nausea, vomiting, and a coated tongue." From the experiments of Liebreich, it appears that the digestion of albumen is retarded.

As potassium nitrate is quickly absorbed and excreted, it is possible that there is not time for its poisoned properties to have more than a passing effect. Whatever may be the result of an occasional dose, the effects on the human system of a prolonged course of the salt have not been investigated. It is conceivable that in the presence of large quantities of vegetable food some of the nitrate might be reduced to nitrites, as occurs in herbivora, and a nitrite poisoning result. Possibly some cases of marked collapse, which have been put down to ptomaine poisoning from tinned food, have been the result of nitrite poisoning. It is to be remarked also that the nitrates appear to be reduced when decomposition of the meat takes place, and here there is a danger from the probable ingestion of nitrite.

Under active service conditions a man would eat, as he did during the war in South Africa, at least 1 lb. of tinned meat in the twenty-four hours, continuously perhaps for months, and the salt cannot be of service in the economy, even if it is not harmful. An investigation of this subject would be of the greatest interest, especially as to how the nitrates are disposed of or excreted from the body. Ringer states that the nitrates readily pass from the body through the kidney with the urine. After a meal of cooked salt beef I found nitrates, by the diphenylamine and  $\text{H}_2\text{SO}_4$  test, present in the urine two hours later. They were not looked for after this period.

It might be advisable to lay down a standard for the amount of nitrate allowable per pound in tinned meats for soldiers' use.

*Qualitative Test.*—Of all the qualitative tests for the presence of nitrates in meat, diphenylamine and sulphuric acid were found to give by

far the most satisfactory results. It is best carried out by using a 1 per cent. solution of diphenylamine,  $\text{NH}(\text{C}_6\text{H}_5)_2$ , in concentrated sulphuric acid.

*Quantitative Estimation.*—For the quantitative estimation, Stuber's modification of Schloësing's method,<sup>1</sup> and the gravimetric method of Paal and Mehrrens (*Zeit. Nahr. Genussm.*, 1906, 12), based on Busch's method for the estimation of nitric acid by means of "nitron," were used. It was found that the results closely corresponded in either case and gave equally good results. Paal and Mehrrens' method is founded on the insolubility of "nitron" nitrate. "Nitron" (diphenyl-endo-amido-dihydro-triazole) precipitates the nitrates in a watery extract of the meat containing them. This is, perhaps, of the two, in meat analyses, more easily accomplished and requires less apparatus.

#### THE METALS PRESENT.

*Metals.*—The metals present in tinned meats are chiefly found in the discoloured patches formed by contact with the tin. The blackening of the interior is not necessarily proportionate to the amount of metals found. It is highly probable that the absorption of the metal found in meat takes place very soon after packing. In one tin packed only four months the tin amounted to 0.089 gramme—the highest figure found.

The iron is chiefly absorbed from the tins at time of packing, the tin from the solder, and perhaps from the tin plating, and the zinc from the seams where zinc chloride has been used as a flux, or from the plating itself. Hence the necessity for careful washing and drying the tins before use. It is probable that the blackening of the inside of the tin is more or less protective as long as corrosion has not taken place.

*Iron.*—Iron was found in appreciable amounts in all the samples; the highest amounts were 3.090 grammes per tin, in a tin ten months old, 2.284 in a tin five months old, and 2.705 in one three years and four months old. It is certain that iron must be present in all tinned foods, but many tins contain an excessive amount. It occurs as the phosphate, oxide ( $\text{Fe}_2\text{O}_3$ ), sulphide and oleate. Much of the discoloured patches would probably be cut away before being eaten, but by more careful preparation their presence could, to a great extent, be avoided.

*Tin.*—Tin was present in traces in nearly all the samples examined. It is dependent to some extent on the amount of acidity, as, for instance, much larger quantities are found in tinned fruits and vegetables. Leach showed that in general the amount of tin dissolved in tinned foods (chiefly vegetables) in three months was the maximum amount, and practically afterwards no further solution took place.<sup>2</sup> The importance of analysis of tinned meats for metals, before the contracts are placed, is here evident.

<sup>1</sup> *Zeit. Nahr. Genussm.*, 10, 1905.

<sup>2</sup> Annual Report, Massachusetts State Board of Health, 1899.



## 92 *Physiological Effects of Food, &c., on the Soldier*

**Zinc.**—Out of twelve tins examined for metals zinc was found in all, reaching, in two instances, somewhat high figures. In one—a tin packed for nearly three years—there was 0·1 per cent. of zinc.

**Nickel.**—Nickel was present in traces in two samples, but is of no importance.

**The Fuel Value.**—The calories per pound averaged 1,282 in the case of corned beef, being higher than those of roast beef. The higher value is due to a greater proportion of both fat and protein, but chiefly to the fat. The fuel value of both corned and roast mutton was found to be higher than that of beef, owing to a higher percentage of fat. In Sample 8B, one of the new American contracts, where it was advised that the amount of fat should not exceed from 6 to 8 per cent., the fuel value only equalled 762 calories per lb., which, as shown by analyses, is somewhat low. In Sample No. 17, containing 57·04 per cent. of fat and only 15·37 of protein, the calories per pound reached the highest figure found, namely, 2,691. It was obvious that, as a food, this sample was useless, being in appearance objectionable and nauseating in taste.

### NITRATES PRESENT AS $\text{KNO}_3$ .

No. of sample	Beef or mutton	Colour of meat	Grammes per cent. of $\text{KNO}_3$ found	Average amount present in whole contents, grammes per tin	Weight of meat in the tin in grammes	Remarks
1	Roast beef ..	Red ..	0·064	0·246	385	—
2	Corned beef ..	„ ..	Marked traces	„	377	—
3	Corned mutton	„ ..	„	„	780	—
4	Roast mutton..	Brown ..	<i>Nil</i>	„	2,821	—
5A	Corned beef ..	Red ..	0·112	1·020	911	—
5B	„ ..	Brown ..	<i>Nil</i>	„	911	This sample the same as 5A, but was blown and putrid.
6	„ ..	Red ..	Present	„	737	—
7	„ ..	„ ..	0·056	0·428	766	—
8	Roast beef ..	Brown ..	<i>Nil</i>	„	822	—
9	Corned beef ..	Red ..	0·083	0·312	381	—
10	„ ..	„ ..	0·120	0·512	427	—
11	„ ..	Slightly red	<i>Nil</i>	„	780	—
12	„ ..	Red ..	0·152	0·516	340	—
13	Corned mutton	„ ..	0·082	0·360	410	—
14	Corned beef ..	„ ..	0·014	0·104	740	—
15	„ ..	„ ..	0·104	0·731	703	—
16	„ ..	Brown ..	<i>Nil</i>	„	373	—
17	„ ..	Red ..	0·213	1·065	500	—
18	„ ..	„ ..	0·155	1·343	867	—
19	„ ..	„ ..	0·217	1·802	370	—
20	„ ..	„ ..	0·290	2·137	737	—
21	„ ..	„ ..	Present	„	385	—
22	Corned mutton	„ ..	0·204	1·815	895	—

TABLE OF METALS FOUND. ESTIMATED ON THE WHOLE CONTENTS

No. of sample	Age of sample	Condition of interior of the tins	Average weight of contents of tins in grammes	IRON		TIN		ZINC	
				Acidity as lactic acid, grammes per cent.	Grammes per cent., average 3 tins	Average amount per tin, grammes	Average amount per tin, grammes	Grammes per cent., average 3 tins	Average amount per tin, grammes
1	1 year 3 months..	Bright; slight rust in places	385	0.45	0.120	..	..	..	..
2	10 months..	Blackened ..	377	0.45	0.817	..	..	..	..
3	1 year 9 months..	Three blackened, three bright	780	..	0.046	..	..	..	..
4	5 years 7 months	Blackened in places	2,821	0.45	0.070	..	..	..	..
5A	2 years 4 months	Fairly bright	911	0.63	0.040	Traces	0.0003	0.0085	0.004
5B	2 years 4 months	Tin blown, slight blackening	911	1.62	0.005	..	..	..	..
6	2 years 10 months	Slightly blackened	737	0.45	0.009	..	..	..	..
7	2 years ..	Blackened ..	766	0.63	0.210	..	..	..	0.918
8A	2 months..	Much blackened	822	0.45	Traces	..	..	0.120	..
8B	2 months..	Blackened in places	822	0.63	Traces	..	..	..	..
9	3 months..	Blackened ..	381	0.54	0.087	..	..	..	..
9A	3 months..	Much blackened, much solder in seams	381	0.45	0.37	..	..	..	..
9B	3 months..	Slightly blackened	381	0.45	0.15	..	..	..	..
10	2 years 11 months	Somewhat blackened	427	0.47	0.15	..	..	..	..
11	1 month ..	Bright ..	780	0.63	0.114	0.0043	0.033	Traces	..
12	3 months..	Bright, some red discoloration	340	0.26	0.260	0.0009	0.003	0.018	0.050
13	3 years 3 months	Bright, some black and red discoloration	440	0.42	0.090	Nil	..	0.005	0.022
14	4 months..	Much blackened	740	0.56	0.40	0.012	0.089	0.008	0.059
15	3 years ..	Much blackened, corroded in places	703	0.33	0.100	0.004	0.028	0.010	0.070
16	1 year 9 months..	Fairly bright	373	0.45	0.30	0.0002	0.0007	0.0063	0.023
17	10 months..	Bright ..	500	0.27	0.074	..	..	..	..
18	3 months..	Fairly bright	867	0.36	0.220	0.004	0.034	0.0135	0.117
19	3 years 3 months	Much blackened	370	0.63	0.100	0.001	0.003	0.013	0.048
20	5 months..	Not much blackened	737	0.54	0.310	0.010	0.073	0.009	0.068
21	1 year 3 months..	Much blackened	385	0.36	0.233	0.0026	0.010	0.042	0.161
22	3 years 4 months	Much blackened	895	0.36	0.310	..	..	..	..

PERCENTAGE COMPOSITION OF MEATS EXAMINED.

Nature of samples, all brands	No. of tins exam- ined	No. of ana- lyses	—	Water, per cent.	Ash, per cent.	Total nitro- gen, per cent.	Pro- tein, N. × 6·25, per cent.	Fat, per cent.	Average calories, per lb.
Corned beef ..	19	70	{ <sup>1</sup> Maximum	58·64	5·00	5·30	35·56	60·29	2,691 <sup>2</sup>
			{ Minimum	22·93	1·67	2·34	14·63	6·96	903
			{ Average	51·05	3·56	4·44	28·72	17·74	1,282
Roast beef ..	3	7	{ Maximum	67·08	4·88	5·34	33·35	12·55	1,149
			{ Minimum	52·42	1·99	2·63	16·48	5·37	762 <sup>3</sup>
			{ Average	61·44	3·07	4·19	26·21	9·82	901
Corned mutton	3	18	{ Maximum	59·22	3·76	5·17	32·31	42·19	2,064
			{ Minimum	29·15	1·26	3·72	23·25	12·66	1,354
			{ Average	43·34	2·71	4·39	27·43	27·76	1,680
Roast mutton ..	1	3	Average	40·90	1·60	5·07	32·01	25·49	1,669

<sup>1</sup> The terms maximum and minimum refer to the entire number of tins examined in each ration.

<sup>2</sup> In this case the fat = 60·29 per cent.

<sup>3</sup> In this sample the fat = 5·37 per cent.

(To be continued.)

## BRITISH MEDICAL ASSOCIATION.

### UTERINE CANCER COMMITTEE.

#### A.

#### AN APPEAL TO MEDICAL PRACTITIONERS TO PROMOTE THE EARLIER RECOGNITION OF UTERINE CANCER.<sup>1</sup>

THE attention of all medical practitioners is directed to the necessity of emphasising the curability by operation of uterine cancer in its early stages.

The adoption of a more extensive operation by the abdominal route has made it possible to deal successfully with cases hitherto regarded as inoperable, and to remove more of the pelvic cellular tissue as well as a portion of the vaginal walls; it is in these situations that recurrence is prone to develop.

Many patients now present themselves for examination and treatment when the disease is considerably advanced, and it is hoped that by a widespread and accurate knowledge of the early signs and symptoms the number of such patients will gradually diminish.

Special attention is directed to the following:—

- (1) Cancer of the uterus is at first a local disease.
- (2) Cancer of the uterus is often a curable disease.
- (3) Operation is the only satisfactory method of treatment.
- (4) The earlier the disease is recognised the more hopeful are the prospects of treatment.

<sup>1</sup> This appeal has been forwarded to us by the Editor of the *British Medical Journal*.

(5) The risk of operation in early cases is slight, and the chance of permanent cure is good.

(6) The recognition of early cancer is not usually difficult, and the disease should not be overlooked by the medical attendant.

(7) A medical practitioner who fails to make a physical examination of a patient exhibiting any of the symptoms of uterine cancer incurs grave responsibility.

(8) Treatment of symptoms without a physical examination is unjustifiable.

(9) Early cancerous ulcers should not be treated with caustic; their appearance becomes masked, and valuable time is lost.

(10) It is an error to wait and observe in order to arrive at a diagnosis.

(11) In doubtful cases a diagnosis must and can be made in a few days.

(12) To examine, to diagnose, and then to treat, should be the rule in all cases.

#### *Symptomatology.*

Uterine cancer is at first a painless disease which does not affect the general nutrition.

The early symptoms of cancer are: Irregular bleeding of any description, even if there be only traces; bleeding *post coitum*; and watery, blood-tinged discharge. There may be no loss of strength or wasting, nor any condition to alarm the patient. Pain, wasting, profuse bleeding, and foul discharge indicate advanced disease.

As the majority of cases occur between the fortieth and fiftieth year, the symptoms are too often regarded by the patient as due to "change of life." The medical attendant should not accept this assumption until he is satisfied that cancer does not exist.

Bleeding, however slight, occurring after the menopause, should give rise to suspicion that cancer is present.

#### *Examination.*

If a patient with any of the above symptoms comes for advice, a careful visual and bi-manual examination must be made before any treatment is recommended.

Should a patient refuse to be examined—and this is exceptional when the situation is explained—the medical attendant should decline any further responsibility, and no treatment should be advised. The examination should be made, even if bleeding is present, as valuable time may be lost by postponement until the hæmorrhage has ceased.

It is most important to observe rigid aseptic precautions in all manipulations.

In the examination, the condition of the vaginal portion of the cervix and of the cervical canal should be carefully noted.

In the early stages new growth may be found on the surface of the vaginal portion of the cervix, in the lining of the cervical canal, or in the substance of the cervix. Any prominence on the surface of the vaginal portion or any ulceration, *i.e.*, a definite loss of substance, should at once arouse suspicion. A nodule or nodules, hard, inelastic, or irregular in outline, felt in the substance of the cervix, suggest the presence of cancer. If the whole cervix be affected, the relative hardness as compared with the soft elastic body is pronounced.

The detection of high-lying cervical cancers, and cancers of the body of the uterus, is only possible after curettage or digital exploration.

The signs common to the early stages of cancer of the cervix uteri are :—

(1) The definite occurrence of new growth on the surface of the vaginal portion of the cervix, in the lining of the cervical canal, or in the substance of the cervix.

(2) Friability.

(3) Bleeding on manipulation.

(1) The definite occurrence of new growth on the portio vaginalis or in the cervical canal cannot fail to arouse suspicion. When, however, thickening of one lip or a portion of one lip of the cervix exists, the nature of the growth is difficult to determine if the mucous covering be still intact. It is then necessary to remove a portion of the affected tissue and examine it under the microscope.

(2) Friability is a sign of the greatest importance, and may be tested by the finger-nail, curette, uterine sound, or an ordinary long probe. Degrees of friability exist in early cases, depending upon the amount of interstitial tissue contained in the growth.

(3) The occurrence of free bleeding after the slightest manipulation is, when combined with friability, a valuable diagnostic aid.

#### FORMS OF UTERINE CANCER.

##### *Vaginal Portion of the Cervix.*

(1) *Infiltrating Type.*—In this type, one lip, or a portion thereof, or even the entire vaginal portion of the cervix, is infiltrated with cancerous growth. Ulceration occurs early from the surface inwards, or necrosis may begin in the centre, and opening on the surface, lead to the formation of a deep ulcer, with undermined edges. The growth is somewhat hard in consistence, but is still friable if tested with the probe, curette, or finger-nail.

(2) *Papillomatous or Polypoid Type.*—This includes the so-called cauliflower excrescence, and is characterised by the growth from the margin of the os externum of a rounded or flattened tumour, varying in size, which may or may not have a definite stalk. It has a papillary surface, bleeds readily, and is very friable. More rarely it resembles

a bunch of soft papillomata. Portions of the growth, pale red or greyish yellow in colour, are easily detachable on examination.

(3) *Superficial Flattened Type*.—This is characterised by a flattened growth on the vaginal portion, which tends to spread over its surface. It is prone to early ulceration, and is frequently seen clinically as an ulcer. The lip or portion affected is thickened. The ulcer has a sharply defined, raised edge, indented at places, yellowish grey, finely granular surface, a moderate amount of loss of substance, and an infiltrated base. It bleeds readily on touch, and the amount of hæmorrhage is entirely out of proportion to the amount of injury inflicted. The finger-nail can detach small pieces from its surface.

#### *Cervical Canal.*

(1) *Superficial Type*.—The inner surface of the cervical canal is lined by an irregular papillary growth, which at first attacks the substance of the cervix superficially. As the growth increases portions of it may protrude through the external orifice of the cervical canal. When ulceration occurs the superficial portion of the growth is shed, with consequent hollowing out of the cervical canal, whilst the remainder of the periphery of the cervix is more or less thickened by infiltration. Where the external os uteri is narrow the process may be hidden, or patency of the os uteri may be produced by destruction of its margin, whilst in uteri where the os is already wide a crater-like cavity is formed.

(2) *Infiltrating Type*.—The cancerous infiltration proceeds from the mucous membrane deep into the tissues of the cervix, and thus the whole cervix becomes thickened and enlarged, or the enlargement and infiltration may be limited to one or more portions of the cervical walls. Necrosis may commence on the mucous surface, or in the centre of the infiltrated area, and may lead to extensive destruction of the cervical tissues.

*Probably the majority of cancer cases which are overlooked are examples of disease affecting the lining of the cervical canal or the tissues of the wall of the cervix.*

Cancer beginning in the cervical canal is not difficult to detect where the os uteri is dilated as in many multiparæ. The finger passed into the cervical canal feels irregular elevations or nodules from which portions may be removed. Free hæmorrhage follows this manipulation. Difficulty arises where the os uteri is not dilated and the disease is hidden. A sound carefully passed into the cervical canal may give the impression of impinging on an irregular nodular surface, or friable tissue may be removed by the curette. Free hæmorrhage following such manipulations is a suspicious sign. Thickening and hardening of the cervix may be detected by a rectal examination, which is most helpful in detecting cancerous nodules in the cervical walls, and should always be made in such cases.

*Body of the Uterus.*

If the vaginal portion of the cervix, the cervical canal, and the cervical walls have been proved to be free from disease attention must be directed to the body of the uterus. The uterus may not be enlarged, although a cancerous growth exists in its interior. Usually, however, there is some increase in size, which in advanced cases may be considerable.

*Microscopical Investigation.*

In doubtful cases, if there be a suspicious hard nodule, or erosion, or ulcer on the external os uteri, a piece including a boundary of healthy tissue should be excised.

The vulva and vagina having been thoroughly cleansed, the posterior vaginal wall should be retracted by means of a speculum, and the cervix pulled slightly downwards with a volsellum. A wedge-shaped piece, the size of a pea or bean, including a margin of healthy tissue, should be excised with a sharp knife.

The bleeding which follows this little operation should be stilled by the insertion of one or two sutures, or by firm tamponade with a strip of gauze. An anæsthetic is not essential. The patient should be kept in bed for twenty-four hours.

The tissue removed should be transferred to a small stoppered bottle filled with absolute alcohol or methylated spirit, and forwarded without delay to an expert in uterine pathology.

Where the cancer originates in the body of the uterus or in the cervical canal, it is frequently possible, by using the curette, to obtain a sufficient amount of tissue for examination without the aid of anæsthetics. If this cannot be done, it may be necessary under an anæsthetic to curette the whole interior of the uterus and cervix, special attention being paid to the region of the tubal orifices.<sup>1</sup> All fragments should be collected, including those which may have been washed out. The douche, if employed, should consist of sterilised water or a weak solution of corrosive sublimate (1 in 10,000), as carbolic acid and lysol interfere with the staining of the cells.

The fragments should be transferred to a stoppered bottle filled with absolute alcohol or methylated spirit.

If the expert's report is favourable the patient will be reassured, if unfavourable immediate operation is imperative.

*The Operation.*

The question of operation is best decided by the operator, who may require to examine under anæsthesia.

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<sup>1</sup> Special care should be taken in using the curette as the cancerous uterus is easily perforated.

*To Recapitulate.*

(1) Attend to all symptoms suspicious of cancer, and instruct the patient on their importance.

(2) Examine immediately all cases of bleeding or abnormal discharge.

(3) Make a definite diagnosis and do not wait for the disease to develop.

(4) Urge immediate operation if the diagnosis is established.

The practitioner who diagnoses cancer in an early stage, when operation offers a probability of cure, renders a service to his patient as great as that rendered by the operator.

## B.

AN APPEAL TO MIDWIVES AND NURSES IN ORDER TO PROMOTE THE  
EARLY RECOGNITION OF CANCER IN THE WOMB.

Cancer of the womb is a very common and fatal disease in women, but *it can be cured by operation when it is recognised early*. A woman sometimes tells a nurse or midwife her ailments before she speaks to a doctor, and the nurse or midwife has then an opportunity of aiding our crusade against this terrible disease.

*Cancer may occur at any age and in a woman who looks quite well and who may have no pain, no wasting, no foul discharge, and no profuse bleeding.*

To wait for pain, wasting, foul discharge, or profuse bleeding is to throw away the chance of successful treatment.

The early signs of cancer in the womb are :—

(1) *Bleeding*, which occurs after the change of life.

(2) *Bleeding* after sexual intercourse, or after a vaginal douche.

(3) *Bleeding*, slight or abundant, even in young women, if occurring between the usual monthly periods, and especially when accompanied by a bad-smelling or watery, blood-tinged discharge.

(4) *Thin watery discharge* occurring at any age.

The nurse or midwife who is told by a patient that she has any of these symptoms should insist upon her seeing a medical practitioner in order that an examination may be made without delay. By doing so she will often help to save a valuable life, and will bring credit to herself and to her calling.



## Reviews.

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THE BRITISH HEALTH REVIEW. Edited by L. Hodgkinson. Vol. i., No. 1. Price 3d. monthly; 4s. per annum. Post free.

While this periodical professes as its aim "to make each individual realize the interest of health," all the articles, with the exception of a short but thoughtful and philosophic paper by Dr. C. W. Saleeby, on the "Future of the Race," are simply special pleadings for vegetarianism. Judging from the first number, we think the adoption of such a title by the editor for a paper intended simply to propagate vegetarian or fruitarian tenets, is, to say the least, dangerous. However, anyone buying the paper under a delusion as to its real nature is not likely to be much injured.

There are the usual assertions, unassisted by argument, of the evils of meat-eating. The convinced vegetarian is as invulnerable to reason as the anti-vaccinationist or the anti-vivisectionist, and to attempt to meet their assertions would simply waste our readers' time.

The unconvinced will not alter their opinions by anything brought forward in this periodical. A. A. S.

"'PAPPATACIFEVER,' A THREE-DAY FEVER ENDEMIC IN THE ADRIATIC LITTORAL DISTRICTS OF AUSTRIA-HUNGARY." ("Das Pappataciefieber, Ein endemisches Drei-Tage Fieber im Adriatischen Küstengebiet Oesterreich-Ungarns.") By R. Doerr, K. Franz and S. Taussig. Pp. 166, with 13 Drawings in the Text, 2 Microphotographic Prints and 1 Chart, 10½ inches by 6¾ inches. Leipzig and Vienna: F. Deuticke, 1909.

In this work are published the initial results obtained by a Commission of Army Surgeons appointed by the Austrian War Office to investigate a form of fever which was giving rise to anxiety on account of the large amount of sickness and inefficiency which it occasioned among the troops quartered in certain parts of Herzegovina and Dalmatia.

This fever, which had long been known to the inhabitants of these countries, had been variously considered to be due to malaria, influenza, typhoid fever, gastric catarrh, or to the effects of exposure to the sun. It occurred only in the summer months, from May to October, and newcomers were almost inevitably attacked. Although the fever only lasts three days, the after-effects are severe and sufferers are, as a rule, totally incapacitated for eight to fourteen days. As many as 30 per cent. of the strength of a unit have been incapacitated at one time, and the disease has therefore interfered gravely with the execution of military duties.

Taussig, on epidemiological grounds, had thought it might prove to be caused by the bites of a minute "sand-fly," whose numbers and distribution he had found to correspond closely with the occurrence of cases of this fever, in point of time and locality; and the work of Doerr and his colleagues, as recorded in this book, has clearly established the correctness of Taussig's hypothesis, and has proved that the virus of the fever is

transmitted to man through the bites of this fly, the *Phlebotomus papatasi*.

Doerr's experiments upon medical men and other volunteers showed that the blood taken from a patient in the first day of the fever, if injected into a healthy man, would produce a typical attack, after the usual incubation period. No germs could be isolated from the blood nor could any be seen on microscopic examination; on this account, and as he was able to prove that the virus could pass through a fine-grained filter, Doerr considers that it belongs to the class known as "invisible" or "ultra-microscopic" organisms.

Experiments carried out with the flies themselves were also successful; thus a number of the flies were caught and allowed to feed upon a patient suffering from the fever and were then transported to Vienna, where the disease does not occur. They were then permitted to feed once more upon healthy volunteers, 50 per cent. of whom contracted the fever and went through typical attacks. These experiments further showed that the flies do not become infective until eight days after they have fed upon fever blood, which points to the germ most probably belonging to the protozoa and requiring to undergo a regular developmental stage in the body of the fly.

No treatment has proved specific, and it is obviously a case for the elaboration of an effective system of prevention or prophylaxis. Doerr advocates certain measures, such as the isolation of the sick at a distance of 200 to 300 metres from barracks, the selection of sick attendants from those who have been rendered more or less immune by a previous attack, &c., but it is evident from the description that the problem is peculiarly difficult. The measures which have proved of such value in the case of malaria prophylaxis are, for various reasons, inapplicable here.

Knowledge of the life-history of the fly is still very incomplete. They infest low-lying and warm localities and enter the living rooms in swarms at night; the females only are blood suckers and they bite only in the dark and rarely out of doors. The bites may give rise to great irritation. The larvæ are considered by Grassi, who has written a monograph on the fly, not to be aquatic in their habit but to develop in small collections of dirt or decaying rubbish, chiefly in latrines and privies kept in a badly ventilated and insanitary condition. Net-protection is unsatisfactory on account of the minute size of the fly necessitating a material so closely woven as to render a sleeping room almost unendurable on a hot night.

A somewhat similar fever is known to be prevalent among the British garrisons of the Mediterranean, and Lieutenant-Colonel Birt, R.A.M.C., has recently been sent to Malta to investigate the subject in the light of the above work of the Austrian Army surgeons.

W. B. L.

FIRST LINES IN DISPENSING. By E. W. Lucas, F.I.C., F.C.S. London: J. and A. Churchill, 1908. Pp. 166. Price 3s. 6d. net.

This little work, intended primarily for students, nurses and others whose calling necessitates an acquaintance with the art of compounding medicines, is clearly and concisely written, and contains illustrations of most of the articles usually to be found in dispensaries. It deals with the equipment of the dispensary, weights, measures, and the various

processes employed in the preparation of galenicals. The prescription is carefully analysed and explained, and the more important Latin terms, their abbreviations and English translations are tabulated. Examples of mixtures and the proper methods of dispensing those which require special treatment occupy some thirty-four pages, while to the preparations of powders, cachets, pills, suppositories, ointments, plasters, tablet triturates, pastilles and capsules a similar space is devoted.

Chapters dealing with percentage solutions, solubility, alcohol, synonyms, doses and strengths of potent drugs, and poisons and their antidotes are also included. The author, a pharmaceutical chemist and a late examiner to the Pharmaceutical Society of Great Britain, is one of the leading authorities on all matters relating to practical pharmacy. The work appears to us to be eminently suited to the requirements of candidates for the qualification of dispenser in the Royal Army Medical Corps, and contains in simple, easily understood language just that information which is required by those engaged in compounding medicines.

E. T. F. B.

**RATIONAL IMMUNISATION IN THE TREATMENT OF PULMONARY TUBERCULOSIS AND OTHER DISEASES.** By E. C. Hort, B.A., B.Sc., M.R.C.P. London: John Bale, Sons and Danielsson, Ltd., 1909. Pp. 75. Price 3s. 6d. net.

In this book, which comprises a Paper read before the Royal Society of Medicine, March, 1909, the author discusses the relation of treatment of established infection by inoculation to other methods of treatment.

The first chapter is mainly descriptive of terms used in the subject of immunisation. Treatment by inoculation includes (a) artificial auto-inoculation and (b) hetero-inoculation. The latter term, which is invented by Dr. Hort, includes all inoculations from without, whether of immune serums or vaccines. Both these artificial methods aim at the restoration of immunisation on the same principles as natural immunity is maintained—by spontaneous auto-inoculation.

Chapters II. and III. are devoted to a critical review on the present position of "Hetero-inoculation" and the "Unreliability of the Tuberculo-Opsonic Index." The author is in revolt against what he considers to be the undue importance at present attached to vaccine therapy and opsonins. He is of opinion that "the future progress of immunity research is bound up with the study of cell enzymes." He produces strong and unbiased evidence against the reliability of the tuberculo-opsonic index.

Chapter IV. gives a highly interesting account of spontaneous and artificial auto-inoculation. With the aid of charts (in which the evening temperatures alone are charted), the author attempts to prove that, in established infections with pyrexia, the temperature chart will demonstrate the presence or absence both of auto-inoculation and its subsequent response.

In summing up the advantages of artificial auto-inoculation over inoculation from without, he says truly that "since the practice of hetero-inoculation has become extensive, approved methods of general treatment are in some danger of being deliberately discarded."

Chapter V. gives a short account of autolysis, toxicity of enzymes,

antitryptic index, &c. By "antitryptic index" is meant the relation of the antitryptic power of normal blood serum to that of blood serum in disease. A considerable amount of importance is attached to the value of the antitryptic index as a guide to the amount of auto-inoculation and its response.

The book is full of interest, and will certainly repay study; the theories advanced are well thought out, and without doubt are worthy of careful consideration. It is well printed and includes a full bibliography. There are, however, two obvious errors in the figures on pp. 13 and 15.

A. A. S. and J. C.

NOTES ON NURSING. By Miss Florence Nightingale, O.M. London: Harrison and Sons. 1909. Pp. 111. Price 1s. 6d. net.

This book is a new edition of the well-known "Notes on Nursing," published in 1860. The present edition contains three new chapters (XIV., XV. and XVI.) on "Convalescence," "What is a Nurse?" and "Minding Baby." The majority of the "Notes" remain practically unaltered, and from a nursing point of view are excellent. The arguments used in most instances are convincing, but I would suggest that Miss Florence Nightingale's ideas on the evolution of disease (as given on p. 33) are at least, from a modern scientific point of view, a little unorthodox.

The book is written in a pleasant style, and the chapters are well arranged. Though originally written for conditions which prevailed in 1860 and onwards, "The Notes on Nursing" are still in principle applicable to many conditions of to-day. To nurses, both female and male, the book is strongly recommended. It is full of sound common-sense and valuable information.

The volume is of convenient size, printed in rather small type, and contains 111 pages.

F. M. M.

AIDS TO FORENSIC MEDICINE AND TOXICOLOGY. By W. Murrell, M.D., F.R.C.P. Seventh Edition. London: Messrs. Baillière, Tindall and Cox. 1909. Pp. x., 123. Price 2s. 6d. net.

The seventh edition of this useful little book has been issued. As stated in the preface, it has been carefully revised and restored. A great deal of new material has been added, especially in Part I. (Forensic Medicine), and abstracts of the new Acts bearing on the subject have been incorporated, and condensed.

The book is one of the well-known "Aid" series, and is of a size to be especially useful to medical officers, to whom the question of the bulk of a book is often a matter for consideration, in view of change of station or proceeding abroad. The book is well printed, and will be found to be of the greatest assistance, not only for examination purposes, but in the event of medico-legal cases arising, for refreshing the memory with facts which are apt to be easily forgotten.

F. M. M.

**BLACKWATER FEVER.** By Captain S. R. Christophers, M.B., I.M.S., and Dr. C. A. Bentley. No. 35 (new series). Scientific Memoirs by Officers of the Medical and Sanitary Departments of the Government of India. Simla: Government Monotype Press. 1908. Price not mentioned.

A monograph of 239 pages divided into six parts, each part containing from one to four chapters.

Part I. deals with the four main theories as to the nature and origin of blackwater fever; that it is: (1) a pernicious form of malarial attack; (2) quinine intoxication; (3) A distinct disease due to some specific organism; (4) the result of an induced condition brought about by repeated malarial infection lasting over a certain time.

A study of recorded cases seems to point to two different conditions under which quinine may act in the production of hæmoglobinuria. In one class of case the drug may have frequently been employed with benefit in the treatment of malaria, until a dose has been taken for what has been supposed to be an attack of malarial fever, its administration being then followed by hæmoglobinuria. In another category are those rarer cases where quinine, even in minute doses, is invariably followed by hæmoglobinuria.

The authors can find no record of any case in which the administration of quinine to healthy persons has produced this condition. Although quinine will *in vitro* produce hæmolysis of human blood corpuscles suspended in saline, they found that it does not have this effect on red cells suspended in human blood serum. The view that the disease is caused by some specific organism is not supported by any facts, but the demonstration of the presence or absence of a special parasite is, however, of such fundamental importance that, until absolutely disproved, the possibility of its presence must be given every consideration.

An account of the clinical features and general symptoms of the disease is given in Chapter II., and after reviewing the researches of former workers on blackwater fever, they pass on to their own contribution to its study. Their researches were carried out in the Duars, a tract of country at the base of the Eastern Himalayas.

In Part II. the authors deal with the malarial origin of blackwater fever. The most obvious feature in the Duars is the prevalence and intensity of malaria. After reviewing the different phases of malaria, they discuss the other conditions that are likely to be the cause of blackwater fever. The population of the Duars consists of about 250 Europeans, a somewhat greater number of "babus," and an immigrant population of about 150,000 coolies. The spleen and parasite rates of the employees in a number of gardens give a very good idea of the universal prevalence of malaria. The examination of 1,752 children from forty gardens shows, with one or two exceptions, a parasite rate of 60 to 90 per cent.; the authors lead us to infer that they obtained a blood film from every child whose spleen they palpated.

The parasite most frequently found among Europeans was the malignant tertian, although among native children the proportion of different forms of parasite was about equal. In summing up, they state that they found in the Duars conditions which prevailed in tropical Africa.

The incidence of blackwater fever was from 2 to 3 per cent.

amongst Europeans, from 10 to 15 per cent. amongst babus, and was common among Chinamen, but it seemed to be less common among the coolie class than among natives from the plains of India. The seasonal prevalence of the disease corresponded very closely with that of malaria. In spite of a good deal of enquiry they were unable to get satisfactory evidence of hæmoglobinuria among young coolie children.

Of 160 cases recorded by the authors, only one occurred under six months' residence, but during eleven months they only saw thirteen cases. There were no cases amongst Europeans under six months, and out of a total of sixty-six first attacks, forty occurred between the period of twelve to twenty-four months' residence.

In the author's experience, those who have suffered more than usual from malaria in a blackwater country fall victims in a proportionately short period to blackwater fever. The disease was most frequent on the most malarial gardens, and in the most malarial seasons; also it tended to occur early, and to be severe in those who have been especially subject to malaria.

Chapter III. deals with the search for a special parasite in the blood and spleen of blackwater cases; the most minute and exhaustive scrutiny of the red cells, plasma, and leucocytes of their own cases failed to give any indication of the presence of a piroplasma-like organism; several days were devoted to the examination of a single film. Beyond malarial parasites and the presence of malarial pigment, they failed to discover any "foreign body." They hope to publish the results of their study of the younger forms of malarial parasite (especially the malignant tertian variety).

Out of ten of their own cases, six showed parasites on the first day, and two others abundant pigment. Of seven observations on the second day none showed parasites, but pigmented leucocytes were found in six; in five observations on the fourth, fifth, and sixth days no parasites were seen. In two cases, a study of the organs showed abundant recent pigment in the macrophages and leucocytes of the spleen, but no parasites were found. They concluded that they were dealing with some stage in the progress of malarial infection long continued and constantly repeated.

Part III. opens with an account of clinical and pathological observations on the nature of the process concerned in blackwater fever. The condition of the urine was essentially an oxy-hæmoglobinuria. The hæmosozic value (salt-contents) of the urine was such that it could not dissolve red cells. By receiving the blood into hypertonic citrate solution and centrifuging, they showed that true hæmoglobinæmia was present. All the elements of the blood, both red cells and leucocytes, showed an increase in size when taken late in the disease; they believe this points to some definite change in the cellular elements or plasma.

They believe that polychromasia is due to regenerative changes. The most noticeable feature in a table of differential blood-counts from eighteen cases is the large mononuclear increase, but as they do not record the total number of leucocytes we presume the increase is a relative one, but they state at the beginning of Chapter V. that the large mononuclear increase is generally a relative one. It appears that the large lymphocyte is included in the term "large mononuclear."

Three types of macrophages are described, the smaller type being markedly phagocytic to red blood cells. They consider that the presence

of endothelial plaques in the peripheral blood points to the presence of some irritant—possibly free hæmoglobin.

Blood was obtained by splenic puncture in five cases; phagocytosis of the red cells was noted, the red cells being either quite normal in appearance or partly decolorised. They were rarely shrunken or deformed. No malarial pigment or parasites were found in three of the five cases, but pigment was present in the fourth case, and one segmenting malignant parasite and pigment were found in the remaining one. They considered that agglutination and phagocytosis of red cells noted in blood from the spleen point to auto-immunisation against the organism's own red cells.

After reviewing some of the toxic blood destructions that can be produced experimentally, they studied the effects of the injection of specific hæmolytic sera on dogs and rabbits. The isotonic point was raised, in some cases, from the normal ( $\cdot45$ ) to  $\cdot7$ ,  $\cdot8$ , and  $\cdot9$ . Varying degrees of anæmia were produced, but there is no record of the blood-counts before the experiments were commenced. Hæmoglobinæmia and hæmaturia occurred in some of the dogs.

They recognised two distinct processes in these experimental anæmias: (1) Phagocytosis of red cells, with or without the presence of hæmoglobin in the plasma and urine; (2) a condition in which the red cells undergo solution in the plasma, which results in hæmoglobinuria. This latter condition they term "lysæmia." They were unable to determine whether this lysæmia was due to a change in the osmotic relations of the blood, or to the production of a specific hæmolysin.

The conditions seen in the spleen and organs of animals inoculated with specific hæmolytic sera resembled in a remarkable degree those which they saw in blackwater fever.

In Chapter IV. a description of the technique for estimating the osmotic relations of the blood is given. It includes a method for measuring the isotonic point of the red cells, and the hæmosozic value of the plasma. They never found marked changes in the isotonic point in blackwater fever, and their researches have been confined to recording comparatively minute variations which, they confess, afford no appreciable support to the view that the hæmolysis bears any relation to osmotic variations in the plasma, though these variations may indicate the action of hæmotoxins.

In Chapter III. are a number of tables showing the results of their researches into the blood conditions of Europeans and others in the Duars and elsewhere. They use their own blood as the "normal," although we are told in an earlier chapter that one of them (C. A. B.) suffered severely from malaria. They demonstrated an isolysin in the blood of "Class A," which, from its frequency in quite healthy conditions, they regarded as physiological. Another group (Class B) possessed red cells, which are susceptible to this isolysin, and almost invariably the organism seemed to have protected itself, in these cases, by the production of an antibody, which will neutralise the isolysin.

The existence of this antibody in Class B suggested the previous action on the blood of a hæmolysin (autolysin). Six European visitors all had Class A blood, and a table, giving the relative frequency of these two classes, shows a remarkable preponderance of Class B over Class A among European residents in the Duars. The authors were unable to say

whether these facts have any relation to the conditions which give rise to blackwater fever. The change from a state of Class A to one of Class B seems to be fraught with possible danger, and residence under blackwater conditions appears to be associated with this change.

In Chapter IV. the nature of the blackwater fever process is discussed. All their researches point to blackwater fever being simply the effect of poisoning by a hæmolysin, and the blood destruction is mainly of that nature to which they have given the name "lysæmia." This lysæmia is due to a hæmolysin acting under special conditions. They have not been able to demonstrate its presence in blackwater fever, but point out that in the case of dogs actually injected with hæmolytic sera, it is impossible, with our present knowledge, to demonstrate, apart from its effects, the presence of the hæmolysin that they injected, though *in vitro* its presence can be demonstrated.

In their concluding remarks on the nature of the blackwater fever process, they review the pathology of the disease from a thoroughly broad standpoint, and a study of Chapter IV., Part IV., cannot fail to give the reader a clearer conception of the conditions under which the hæmoglobinuria occurs.

The authors do not touch on the ordinary palliative treatment, but indicate the lines upon which good results may be hoped for from serum therapy. Although Ehrlich was once able to demonstrate an autolysin (?) in the blood of goats injected with other goats' blood, as far as we know, no one has succeeded in demonstrating the presence of an autolysin by injecting an animal with its own blood. Bearing in mind that the presence of an autolysin in blackwater fever has not yet been demonstrated, the prospects of producing an antibody that will neutralise it do not, at present, seem very hopeful.

An appendix of 50 pages contains records of a number of cases, some of which were investigated by local practitioners.

We look forward to further work from these authors on the subject of blackwater fever.

H. W. G.

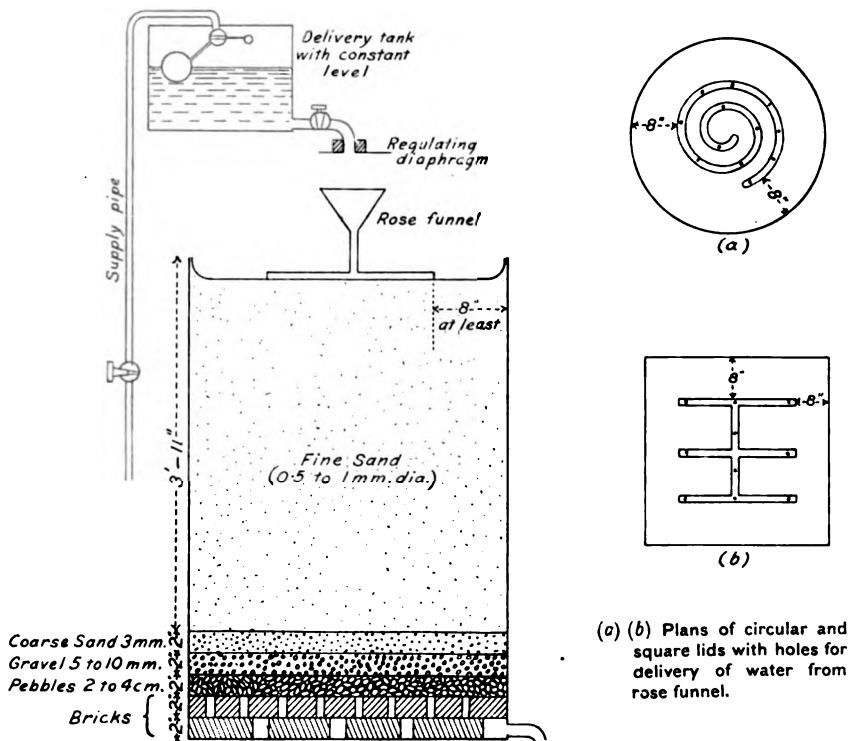




## Current Literature.

**Sand Filters in the French Army.**—A circular of January 28th prescribes the adoption of sand filters in the French army and gives instructions as to the methods of installing and using them in barracks.

The system adopted is that of *Miguel* and *Mouchet*. It is adopted because of its simplicity and the ease by which the filters can be used and maintained, apart from considerations of efficiency. The filters will take the place of the filters and sterilizers installed at present in barracks as the



latter become worn out. The filter is constructed as follows: A galvanised iron, cement or other form of reservoir that will not rust is used. It must have a depth of not less than 4 feet 11 inches (1.50 metres), and a sectional area of not less than  $1\frac{3}{4}$  feet square ( $\frac{1}{2}$  metre square). At the bottom there is an outlet pipe and it is covered by a special lid, described below. This reservoir is filled with the following material in order from below upwards:—

(1) A layer of bricks, 2 inches thick, placed at an interval of  $1\frac{1}{2}$  inches to  $1\frac{3}{4}$  inches from one another.

(2) A second layer of bricks, also 2 inches thick, but placed at an interval of  $\frac{3}{4}$  inch to 1 inch from one another.

(3) A layer of pebbles, 2 inches deep, with diameter of 1 inch to  $1\frac{1}{2}$  inches; *i.e.*, large enough to prevent them falling through the spaces between the layers of bricks.

(4) A layer of gravel, 2 inches deep, the grains of gravel having a diameter of 5 to 10 mm.

(5) A layer of coarse sand, 2 inches deep, with grains of 3 mm. diameter.

(6) A bed of fine sand, 3 feet 11 inches deep. This bed is the filtering or purifying layer, the five layers below being for the purpose of support and draining away the water filtering through this bed. It is important to use sand with grains of 1 mm. diameter. Coarser sand gives too rapid a flow and finer sands too slow a flow.

The shape of the reservoir may be square or round. The lid is constructed with a rose funnel for receiving the water to be filtered and distributing it over the surface through ten to twelve small openings for each square metre of surface. None of these openings must deliver water on to the surface at a less distance than 8 inches from the side of the reservoir; otherwise the water is apt to trickle immediately to the side of the reservoir and pass down between it and the sand-bed, thus becoming insufficiently purified. It is recommended also that the sand should be heaped up round the sides in order to prevent the water flowing directly to the side of the reservoir.

The filter so constructed is fed by an automatic delivery reservoir, adjusted to deliver 70 to 100 cubic feet of water in twenty-four hours, or 450 to 650 gallons of water for each square metre (about 10 square feet) of filtering surface.

When water is drawn direct from very muddy sources, such as rivers, ponds and canals, it is necessary to clarify it before passing it to the filter. For this purpose two clarifying reservoirs, filled with coarse sand to a depth of 12 inches, upon a draining and supporting bed similar to that of the purifying filter, are used. These filters need only have one quarter the filtering surface of the purifying filter; and the water is passed direct from them to the rose funnel of the latter. They must be cleaned frequently, whereas with clear water the purifying filter need not be cleaned more than once a year.

The installation is completed by the provision of a tank for the reception of the filtered water. The tank must of course be protected from contamination, and have a capacity equal to twice the daily output of the filter.

The filter must be installed in a dark place or where the light is diffused. Direct exposure to the rays of the sun favours the growth of *algæ* on the filter, which would render the surface less permeable. It must also be protected from frost for the same reason.

In the instructions regarding the use of the filter it is stated that for the first week the water may be turbid and discoloured according to the kind of sand used, but that afterwards it becomes clear and limpid. It may, however, still contain a considerable number of micro-organisms, but these diminish rapidly during the succeeding days. The process of thus cleansing the filter when it is first installed may require three to four weeks. When this is accomplished, the filter must never be dis-

turbed, except to clear away any layer of clay that forms on the surface and in time prevents water passing through. To do this the lid is removed and the surface of sand to a depth of about 4 inches is carefully scraped away with a trowel, carefully washed in clean water and then replaced. Should the use of the filter be interrupted for some days, bacteria will somewhat increase, but short interruptions of a few hours or a day or two have no such effect.

The filtered water is examined bacteriologically, but the point to note is that, although a few bacteria will always be present, they are innocuous and come from the lower layers of the drainage and supporting beds. Pathogenic micro-organisms in the water to be filtered are invariably arrested in the purifying bed, and do not increase because of the absence of organic matter necessary for their growth.

W. G. M.

**New Committee for Dealing with Infectious Diseases in the French Army.**—A permanent technical committee for the prevention of infectious diseases in the Army has just been created in France. Its duties and constitution are defined in the *Journal Officiel* of February 26th, 1909.

The object of the Committee is to prepare and carry out such measures of prevention as may check the development and spread of infectious diseases. It is to act under the Consultative Committee that has existed since 1904, under the title of "*Commission Supérieure d'hygiène et d'épidémiologie militaires*," for the purpose of studying questions of general interest and proposing measures of protection in connection with the health of the soldiers. The new Committee is thus intended to be an executive body under this Consultative Committee. Its headquarters are the Army Medical College at the Val de Grâce, and its members the professor of epidemiology and microbiology, the assistant professor of the same subjects, a surgeon-major on the headquarter staff at the War Office, and six army medical officers appointed by the Under Secretary of State for War. The first three are *ex-officio* members. In addition, an officer of the rank of *médecin-inspecteur-général* or *médecin-inspecteur* is to be appointed president, and must be a member of the *Commission Supérieure*.

The duties of the Committee are to proceed, on receipt of orders from the Under Secretary of State, to particular localities, and undertake on the spot such bacteriological and other investigations as may be necessary to indicate the most rapid and methodical methods of preventing epidemics. Special equipment is provided for the purpose. The members of the Committee may be consulted by the *Commission Supérieure*, and also required to make reports on subjects referred to them.

The Under Secretary of State for War receives telegraphic notification of the infectious diseases in each garrison, and a return of these is submitted daily to the President of the Committee by the Director-General of the Army Medical Service, with orders, if necessary, to send one of the members to any given locality for the purpose of investigation and action.

W. G. M.

**Field Kitchens in the German Army.**—In the *Royal Engineers, Journal* for May, 1909, there is an article by Colonel E. Hartmann pointing out that "in proportion as the fighting strength of our modern armies has been increased, the difficulties of provisioning them have likewise been enhanced." In order to obtain a field kitchen suitable to German conditions, the Ministry for War in 1905 submitted the question of constructing transportable field kitchens for the Army to a public competition. The results were not very satisfactory; only two models appeared to come up to actual requirements. The suggestion having been offered that the weight of baggage carried by the infantry might be reduced by storing a certain amount of the provisions, ordinarily carried by the men, in the field kitchens, a second competition was offered in August, 1906. The special conditions were, that the field kitchen must be constructed as a four-wheeled, two-horse vehicle, the hind carriage of which must be easily detachable from the fore carriage, and when detached it must be possible to put a horse to each, and to employ either or both parts independently. The hind carriage must contain kitchen utensils, extra rations for horses, fuel for one day, driver's baggage, spare stores, and 200 extra allowances for the men in a separate chamber. The total weight of the charged field kitchen exclusive of the men must not exceed 1,100 kilogrammes. The kitchen must follow infantry along soft or rugged ground, and at a trot along good roads. It must be possible to cook all varieties of field fare in the field kitchen, and danger of burning the food must be excluded by employing a bath of glycerine or other fluid of like properties, especially as to vaporisation and freezing points.

As a result of the trials a field kitchen was finally obtained, the chief characteristics of which are: A four-wheeled vehicle for horses; a fore carriage detachable from hind carriage; copper holding 200 litres in a boiling bath; coffee boiler holding 70 litres of water for making tea or coffee or for diluting food which has become too thick through prolonged boiling; both coppers may be heated singly or simultaneously. The fore carriage contains 200 extra allowances for the men; extra rations for animals; stores; driver's and cook's baggage. The hind carriage contains the cooking appliance and cooking utensils.

The boiling bath surrounds the whole of the inner copper, and prevents food being burned. The range may be heated by coal, wood, or peat during the course of a march. It is stated that even after twelve hours the food still has a temperature of 140° F., and will be palatable up to a period of seventy-two hours. When the food is being distributed or the kitchen being cleaned, the fore carriage may be sent back for fresh provisions.

**Typhusbazillen und Gallenblase (Typhoid Bacilli and the Gall-bladder).** By Josef Koch (*Zeitschrift für Hygiene und Infektionskrankheiten*, Band 62, Heft 1). **Experimentelle Untersuchungen über die Beziehungen der Typhusbazillen zu der Gallenblase und den Gallenwegen (Experimental Researches into the Entrance of Typhoid Bacilli into the Gall-bladder and the Bile-ducts)**, *ibid.* By Raffaele Chiarolanza.—There are three possible ways by which typhoid bacilli may reach the interior of the gall-bladder: (1) By travelling upwards from the bowel; (2) the bacilli in the blood-stream are secreted with the bile and are conveyed by the hepatic duct to the interior of the gall-

bladder; (3) the bacilli in the blood-stream pass through the wall of the gall-bladder from the capillaries of that organ. The authors consider that the last is the correct view, and, in these articles, bring forward facts in support of these views.

In the first article Dr. Josef Koch describes in detail the histological changes in the gall-bladder in a fatal case of typhoid fever. The most characteristic changes are the occurrence of papillomatous projections of the thickened and inflamed mucous membrane into the interior of the gall-bladder. These projections are really the thickened and inflamed folds of the normal mucous membrane. The epithelium has, except in the depths of the sulci between the folds of the mucous membrane, disappeared. Towards the free extremity of some of these papillæ, small homogeneous masses, surrounded by a ring of necrotic tissue, were seen. These were sometimes stained faintly and sometimes darkly and the necrotic area sometimes extended through the whole thickness of the papillæ, finally bursting and emptying its contents into the interior of the gall-bladder. These masses were collections of typhoid bacilli, the toxins of which had produced the surrounding necrosis. How do these bacilli reach the mucous membrane of the gall-bladder? The histological appearances, the occurrence of bacilli in clumps, and the histological results obtained by animal experiment, all suggest an embolic origin in the capillary network at the free end of the papillæ. These clumps of bacilli (*Bazillen nester*) are similar to those found in the spleen, mesenteric glands and kidneys.

After briefly discussing the results obtained by Chiarolanza and himself in their animal experiments, the author discusses the treatment of typhoid carriers in view of the pathological results obtained. Whether similar changes do occur in the gall-bladder of typhoid carriers the author does not know, but presuming these are so, medical treatment to increase the secretion of bile seems hopeless. The only surgical treatment feasible would be excision of the gall-bladder, and in that case only the main focus of the disease would be removed, as similar changes occur in the larger bile passages.

In the second paper the animal experiments are described. They fall into three groups, having been carried out to elucidate the three following problems: (1) If the typhoid bacilli appear constantly in the gall-bladder in typhoid infection; (2) the way in which the typhoid bacilli reach the gall-bladder; (3) whether the bacilli reach the bowel from the gall-bladder or otherwise. To investigate the first question a series of twenty-three rabbits were injected intravenously with varying quantities of typhoid bacilli; seven of them died and the remaining animals were killed at varying intervals of time. Cultures were made from the blood and from the gall-bladder. In the majority of the cases (seventeen) typhoid bacilli were present in the gall-bladder and could be recovered in culture and seen in sections. In another series four rabbits were injected subcutaneously with varying quantities of typhoid bacilli: one died on the tenth day, and the others were killed on the fourteenth, sixteenth and twentieth days. In all four cases both the blood and the bile were sterile, no *Bacillus typhosus* being present.

To elucidate the second point, another series of three rabbits was taken, the cystic duct was tied and then the typhoid bacilli were injected intravenously. One animal died forty-eight hours after injection, while one was killed twenty-four hours after injection and the other three days

after injection. In all the cases the bacilli appeared in large numbers in the gall-bladder, showing that the infection could only have taken place through the wall of the gall-bladder.

In another series of cases Chiarolanza demonstrated that the capillaries of the mucous membrane of the bowel are also infected by intravenous injection of these bacilli. He tied the cystic duct and also the common bile-duct and then injected the bacilli intravenously. In five out of the six cases he found the bacilli in the interior of the small intestine. The histological results obtained in all these animal experiments showed similar changes to those described by Koch in his case in man, showing that the lumen of the capillaries of a single fold of mucous membrane becomes blocked with typhoid bacilli; these are very definitely of true embolic nature, and one can easily study the manner in which the typhoid bacilli pass from these "nests" into the interior of the gall-bladder.

W. E. M.

**Erfahrungen und Studien über Erysipelas (Experiences and Studies in Erysipelas).** By Professor Sørensen (*Zeitschrift für Hygiene und Infektionskrankheiten*, Band 62, Heft 3).—In this article the author gives us his experiences of the cases of erysipelas admitted into the Blegdam Hospital in Copenhagen during a period of twenty years (1884-1904). The total number of cases coming under observation during that time was 2,955, with a yearly variation from 208 in 1886 to 96 in 1896; 277 of these cases (9·37 per cent.) were fatal, the death-rate varying from 15·6 per cent. in 1888 to 4·6 per cent. in 1897 and 1898. There appeared no tendency for the disease to appear in epidemic form.

Of the 2,955 cases, 1,191 were men, 1,532 were women, and 232 were children; the death-rate, however, was 19·4 per cent. in children, 11 per cent. in men, and 6·6 per cent. in women. The author attributes this to the low power of resistance of the children affected, and the greater mortality in men than in women to the effects of alcohol. Out of 55 men dying of erysipelas from 1895 to 1904, 22, or 40 per cent., suffered from acute alcoholism. During the same period only five adults, two young men and three young women, died of an ordinary uncomplicated erysipelas.

Of the twenty-five children who died during this period (1895-1904), twenty were quite young, usually a few months, sometimes only a few weeks old, and in three of the remainder it was the terminal affection to some other malady. The fatal result in the majority of the cases mentioned was attributable to the weak constitution of those affected, thereby confirming the observations of the older authors that erysipelas in itself is a comparatively harmless disease.

Out of 1,832 cases, the disease was situated on the face alone in 814, face and head in 693, head alone in 1, trunk in 12, upper extremity in 35, lower extremity in 183, ambulant cases (spreading from head to trunk, or from trunk to extremities) in 93, and in different parts of the body in one case. The very great rarity of erysipelas occurring in isolated patches in different parts of the body is of importance in the differential diagnosis from other skin inflammations. Erysipelas of the face and head is much commoner in adults than in children, whereas erysipelas of the extremities is much commoner in children than in adults.

Considering the relation between the situation of the erysipelas and the fatality of the cases, 45 per cent. of the trunk cases proved fatal, 23 per cent. of the ambulant cases, 18 per cent. in the lower extremity, 11 per cent. in the upper extremity, 7 per cent. in erysipelas of the face, and 6 per cent. in cases affecting the face and head. The reason for this high mortality in trunk cases is because of the frequent occurrence of erysipelas after surgical interference in severe illness, especially cancer of the mamma. The comparatively high mortality in erysipelas of the extremities and in the ambulant form is due to their relative frequency in very young children.

The author deals with the following complications: Suppurative processes, albuminuria, joint rheumatism, and acute alcoholism.

Suppurative processes were present in 7.6 per cent. of the cases observed, and in 18.8 per cent. of the fatal cases. These processes are further divided into four different heads: gangrenous and phlegmonous erysipelas, post-erysipelas abscesses, erysipelas and cellulitis, erysipelas and suppurative lymphangitis; 81 per cent. of the first group occurred on the lower extremity. The author divides the post-erysipelas abscesses into two classes, large and small, the large abscesses being commonest in the lower extremity, whereas the small abscesses occur most frequently on the eyelids.

Albuminuria was present in 20 per cent. of the cases; it was usually small in amount, of short duration, rarely produced bad effects, and was without weight in prognosis. Sometimes blood was present in addition to the albumin.

Joint rheumatism occurred in twenty-six of the 1,099 cases observed, or 2.4 per cent. Eight of these cases had suffered from previous attacks of rheumatism. The rheumatism was usually polyarticular, quite amenable to sodium salicylate, and only one case showed heart complications. There were two severe cases of monoarticular rheumatism. In one case—a woman, aged 56—1 cc. of seropurulent fluid containing streptococci was drawn off from one knee-joint, which subsequently required arthrotomy. The other was a severe affection of the left knee-joint in a fatal case in a child aged 2 months.

As already stated, 40 per cent. of the fatal cases in men were due to acute alcoholism. This complication was especially prominent in cases involving the face and head.

A non-alcoholic delirium was also occasionally present, and the author had under observation five cases of acute psychosis, only one of whom had previously suffered from insanity.

Before concluding the article the author deals with those very interesting cases of recurrent erysipelas which are commoner in children, and which he considers are probably "carriers." He also treats of erysipelas of the throat, and describes nine cases in detail. The larynx was never involved. The experience in Copenhagen was all against any relation between erysipelas and puerperal affections, only two cases occurring during the twenty years.

W. E. M.

## Correspondence.

### FIELD SERVICE MEDICAL HANDBOOK.

TO THE EDITOR OF THE "JOURNAL OF THE ROYAL ARMY MEDICAL CORPS."

SIR,—At the request of many officers of the Royal Army Medical Corps and of the Indian Medical Service I had intended publishing a Field Service Medical Handbook, a sort of *vade mecum*, at the end of the year, hoping it would be of some use to medical officers of the British Colonial Service. Unfortunately I now find there are so many obstacles in the way that I have reluctantly decided to cease compiling this small volume, at least for the present, but shall be very pleased if you will kindly publish some of its contents in the Corps Journal from time to time. I take this opportunity of thanking all those who by their good wishes stimulated me to commence this work.

Kirkee, India,  
May 10th, 1909.

I am, &c.,  
F. J. WADE-BROWN,  
Major, R.A.M.C.

### MAKING LANTERN SLIDES FROM DIAGRAM.

TO THE EDITOR OF THE "JOURNAL OF THE ROYAL ARMY MEDICAL CORPS."

SIR,—In the February number of the JOURNAL OF THE ROYAL ARMY MEDICAL CORPS a method of making diagrams on glass for use in a lantern is described. As the ink does not run well on plain glass unless scrupulously clean, the following preparation is recommended. Take:—

Benzole )  
Gold size ) equal parts.  
Rubber solution, a few drops

(from the tubes sold with the tyre-repairing outfits).

The gold-size and benzole are well mixed, the rubber dropped in, the whole stirred till dissolved and, if necessary, filtered. The solution should be kept in a tightly stoppered bottle and will remain fit for use for a long time.

The glass slide, which must be "lantern size," is cleaned with ether or alcohol, held in the fingers with the side to be coated uppermost. A quantity of the material is then poured on to the centre of the glass and allowed to run all over the surface. The slide is then stood on edge to drain, with one corner lowest, in a warm, still place. When perfectly dry it can be put away for future use. The surface can be drawn or written on with Indian ink, preferably with a mapping pen, and small diagrams traced. Covering with a second glass slip and binding renders the slide permanent. These slides can be used without darkening the lecture room, and are so used at this college.

Royal Army Medical College,  
May 28th, 1909.

I am, &c.,  
C. F. WANHILL,  
Major, R.A.M.C.



## VICTORIA CROSS PICTURES.

TO THE EDITOR OF THE "JOURNAL OF THE ROYAL ARMY MEDICAL CORPS."

SIR,—I feel sure it will interest officers of the Corps to know that the Victoria Cross pictures hung in the London Mess have been photographed by a well-known firm of art photographers, and are available for sale.

The whole series numbers twenty, and would make a nice addition either framed or in album form to any of our messes. I have arranged with the photographer, Mr. Laib, of Drayton Gardens, to supply photographs at 3s. 6d. each or £3 for the complete set of twenty.

The Secretary of the Mess will arrange for any orders addressed to him being sent on to Mr. Laib.

*Royal Army Medical College,  
Millbank, S.W.,  
June 7th, 1909.*

I am, &c.,  
D. WARDROP,  
Colonel.

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*Genl. J. M. G. v. S.*

Journal  
of the  
Royal Army Medical Corps.

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Original Communications.

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SIR JAMES McGRIGOR.

BY LIEUTENANT-COLONEL M. W. RUSSELL.  
*Royal Army Medical Corps.*

IN 1811 Dr. James Frank, the Inspector-General of the Medical Department of the Army engaged in the Peninsular War, was incapacitated by illness, and Lord Wellington, in a despatch dated Grenada, October 3rd, 1811, asked that he should "have the most active and intelligent person that can be found to fill his station." The importance of the services to be rendered by the required officer was evidently not undervalued by the General.

In response to this demand the Commander-in-Chief sent orders to Dr. McGrigor, at that time Inspector-General of Hospitals at Portsmouth, to proceed to the headquarters of Lord Wellington and take up the appointment, at the same time assuring Lord Wellington that from personal knowledge he was confident that in Dr. McGrigor he would find all he could desire.

At the conclusion of the campaign, perhaps the most arduous in which British troops had ever been engaged, the Duke of Wellington, in appraising the services of Dr. McGrigor, wrote: "I have every reason to be satisfied with the manner in which he conducted the department under his direction, and I consider him one of the most industrious, able, and successful public servants I have ever met with."

Praise in such terms from the Duke of Wellington, who was proverbially not lavish in his encomiums, is more than ordinarily expressive, and when it is further noted that Dr. McGrigor, on his

return to England, was spontaneously presented with a costly service of plate by all the medical *personnel* who had served under him through the war, it must be evident that the work he performed could have been of no common order. This record in itself would be sufficient to render the study of his career attractive to any military medical officer. But his service in the Peninsula was only the culmination of a long period of active service in many quarters of the globe, ranging over Flanders, Walcheren, the East and West Indies, and Egypt; and the prelude to his long and eventful tenure of the post of Director-General of the Army Medical Department, a position which he held to the great advantage and advancement of the Service for a period of thirty-five years.

Of his service prior to his succeeding to the Directorate of the Department he has fortunately left us an account written by himself. This *Autobiography*<sup>1</sup> is a book which no military medical officer can afford to leave unread. It is written with the most engaging simplicity, modesty and candour. Packed with incident as a boys' book of adventure, it keeps the reader's attention rivetted until the last page is reached; and it is only then that he begins to realise what a fund of experience and solid information is contained in its pages, so easily has the narrative flowed and so absorbing has been the subject. It is only possible in a sketch such as the present to give the mere outlines of this distinguished soldier's career, and to touch but lightly on his high ideals and the deep debt owed to him by the Service he worked for so faithfully and well. He raised the Medical Service from a very slough of despond to a plane such as it had never seemed likely to attain, a position only lost by the neglect, in time of a prolonged peace, of the lessons taught and learned at bitter cost in the course of a lengthy and hard-fought series of wars. His was no mean conception of the duties and value of the Medical Service. He realised to the full that the efficiency and fighting value of an army were closely interwoven with the efficiency of its medical branch, and he laboured incessantly, and not without success, to perfect this branch and to bring its true function home to the minds of those in authority. It was said by Sir William Napier, the eminent historian of the Peninsular War, that he thought the extraordinary exertions of the medical officers of the Army might be said to have

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<sup>1</sup> "The Autobiography and Services of Sir James McGrigor, Bart., late Director-General of the Army Medical Department, with an Appendix of Notes and original correspondence." London: Longman, Green, Longman and Roberts, 1861.

decided the day at Vittoria, for their exertions had undoubtedly added a full division to the strength of Lord Wellington's Army, and without these 4,000 or 5,000 men it is more than doubtful if his lordship, with all his unrivalled talents, could have carried the day. Of the Duke of Wellington's own opinion he has left us in no doubt.

Sir James McGrigor was the eldest son of Colquhoun McGrigor, a merchant in Aberdeen. He had two brothers, one of whom followed his father's occupation and the other, Lieutenant-Colonel Charles McGrigor, served with distinction in the East and West Indies, America, and other places. James was educated at the Grammar School, Aberdeen, and was evidently possessed of more than ordinary industry and ability, as he relates, with great glee, that after examination, at the end of his five years' course, the first prize was awarded to him. From the Grammar School he proceeded to Marischal College, where he graduated M.A. in 1788.

Not being inclined to follow a mercantile career, and having been thrown much amongst men reading for medicine, he decided to take up that profession, and entered on his studies accordingly. For three years he pursued his studies in Aberdeen, then went to Edinburgh, where he applied himself so closely that his health suffered and he was obliged to take a rest and return home. He had become enthusiastic in the pursuit of his professional knowledge, and was at this date mainly instrumental in the foundation of the Medico-Chirurgical Society of Aberdeen, a society in which he ever afterwards took a keen and kindly interest, and which bears his name in grateful remembrance to this day.

During the course of his studies at Aberdeen, one of the senior students obtained a commission as assistant-surgeon in a regiment quartered in Jamaica, and immediately exchanged his ordinary headgear for a smart cocked hat and cockade. "He attracted the attention of all and the admiration of some," McGrigor naively admits that he was amongst the latter. At the same time the splendid Highland uniform of a friend, an ensign in the 42nd Regiment, did not diminish the impression made by the smart appearance of his fellow student. But he did not think seriously of a military career at this stage. This was the period of the early days of the French Revolution, and McGrigor's warm sympathies and generous nature were stirred on its behalf, though his opinion subsequently, as he tells us, underwent a complete change.

Having completed his medical education, the course he should now pursue was much debated, and it was finally decided that he

should start as a general practitioner in London. Equipped with many letters of introduction he proceeded thither. But the letters of introduction were of little service; patients did not flock to him, the war against the French Revolutionaries had commenced, the times were stirring, things military were much in evidence, and at the back of McGregor's head was the memory of the smart hat and cockade of his fellow student, and the handsome uniform of his friend, Ensign Stewart, of the 42nd. The wonder would have been had he followed any other course, and in September, 1793, he induced his father to purchase for him, for the sum of £150, the surgeoncy in a regiment which General de Burgh, afterwards Lord Clanricarde, was engaged in raising. The regiment had then neither name nor number, but became, when raised, the 88th, or "Connaught Rangers." With the exception of the major commanding, an Englishman, and McGregor, all the officers were Irish, and many were closely connected by ties of relationship. They were noted for their regular and orderly conduct at a time of general riot and licence.

As an instance of the manners of the time, McGregor mentions that early in the morning after his arrival at Chatham, where his regiment was forming, he was awakened by a great noise, and on enquiry found that two young officers, not belonging to his regiment but who, like him, had arrived the day before, had been "out" in consequence of a dispute, and one had killed the other, the noise being due to the bringing in of the body!

Shortly afterwards McGregor was himself in trouble, and had to challenge a personal friend for a trivial and almost entirely imaginary offence, which was construed as a slight to the regiment. Explanations were useless, and an encounter was only averted by an abject apology from the individual who was deemed to have transgressed. So many of these troubles were due to the universal habit of wine-bibbing that McGregor determined early to avoid that danger, and became noted as one of the most temperate members of the mess.

As soon as formed, the regiment was sent on service to Jersey. It was in the height of the Terror, and the island was thronged with French exiles and occupied by a large garrison. The 88th had already become infected at Chatham with "typhus," which was a veritable scourge, and soon became overwhelmed with it in Jersey. McGregor remarks that the loss to the British Army from this disease during the first year of the war must have amounted to some thousands. He soon fell a victim himself and

had a most severe attack, through which he had the advantage of the attendance of Dr. Robert Jackson of the Buffs, one of the most able military medical officers of the day, whose writings on military medicine and administration and the organisation of armies are still of value.<sup>1</sup>

His regiment was ordered to embark for Ostend before he was yet convalescent, and it was proposed to leave him behind in Jersey with others unfit to go; but his entreaties prevailed, and the colonel consented to allow him to be carried on board one of the transports, where the sea-air and the excitement of going on actual service quickly renewed his health and vigour. After a long journey the force landed at Bergen-op-Zoom, where there was a strong garrison, which it was expected the French would soon besiege. Typhus, which had been quiescent on the transports, quickly broke out again with increased violence amongst the troops on land. The sick of the regiment soon amounted to not less than 200 cases, of whom half were typhus, and the utmost difficulty was experienced in finding accommodation for such large numbers. The British regiment alongside suffered not less severely. "Our sickness increased, our mortality was frightful, and both myself and my only assistant, Mr. Nichol, became severely ill."

Meanwhile the attacks of the French developed fresh energy, which seems to have afforded some distraction for the sore-tried troops. The 88th was withdrawn by water one dark night, and proceeded to Nimeguen to strengthen the garrison there, which was invested by the enemy. Here McGrigor gained further experience of the military side of his work. The surgeon of the 78th being ill, he had the wounded of that regiment to attend to as well as his own.

There were daily encounters, most activity being displayed after dark, when sorties and counter-attacks were frequent. "By and by, at my hospital (a church), where I was in readiness to receive the wounded of the 78th and 88th, many poor fellows were led or carried in to me." The cannonade became heavier, "the large church, in which my sick and wounded with those of other corps were placed, was not spared, although a hospital flag was displayed on the steeple. While engaged in dressing the wounded, I saw several cannon-shot go through the walls and some shells burst into the church." It is interesting to observe that a hospital flag was at that time a recognised emblem.

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<sup>1</sup> "Dictionary of National Biography," xxix., 105



The situation got worse, and again the 88th had to escape under cover of darkness, masking the retreat of the rest of the garrison across a bridge of boats. The French pressed in pursuit and the retirement became a retreat. "Our troops, raw, and composed in a great measure of new levies, gave way under the harassing marches, bad quarters and the toil to which they were exposed. They not infrequently committed excesses and outrage on the inhabitants, and no small animosity existed between them. The Dutch, wishing for the advance of our pursuers, afforded them, as it was said, frequent aid. Disease, particularly typhus fever, became general. Our hospitals were filled to overflowing, and the mortality amongst the medical officers in particular was great. The want of system in our hospitals and the inexperience of medical officers in the duties, in which in after years they became so expert, were at this time very striking." Once more McGrigor was stricken down with fever and lay unconscious for many days. His companion officers died, and he himself was only saved by the devotion of his warm-hearted Irish servant and the kindness of a poor old Dutch couple in whose hovel of a farm he had been left for shelter. When sufficiently recovered, he was taken in a country cart, well stuffed with straw, to the neighbouring port, where his regiment was embarking for England. After many difficulties, he was rowed by a crew of naval seamen to the boat on which his regiment lay, where his friends, who had given him up for lost, were overjoyed to see him again, though much shocked to observe his death-like appearance. His own remark was: "I know not from whom I received the kindest attention on my getting on board—from the officers or the men." At sea he again quickly gained strength, and on reaching England was nearly himself once more.

The Connaught Rangers now went to Norwich, in company with several other regiments returned from abroad. Typhus fever, which had dogged their footsteps throughout, broke out again in a virulent form, sparing no corps in the garrison and laying many low. A large building was hired as a hospital for the worse cases of each corps, and McGrigor, as senior surgeon present, received orders to superintend the whole, a task which he carried out to the satisfaction of all. The position, being his first acting appointment on the staff, was no small gratification to himself. It lasted but a short time, as the regiment soon marched to Southampton to form part of an expedition to the West Indies then being mobilised.

The following extract from the autobiography gives a good indication of McGrigor's character at this time:—

“The 88th was under a new commanding officer, Lieutenant-Colonel Beresford, afterwards Field-Marshal Beresford, who became one of the ablest and most distinguished officers of the British Army. By his order I waited on him every morning with a report of the sick of the corps; he was always discontented with it. One morning, when I found the adjutant and quartermaster of the regiment with him, he appeared unusually out of humour; he neither noticed the bow I made on entrance, nor desired me to be seated. After remaining standing for a few minutes I helped myself to a chair and sat down. Soon after he took the sick report out of my hand, and perusing it, said: ‘This state of things must not continue; I will not have such a number of sick in my regiment, and I am sure the greater part of them are not sick.’ I felt strongly at that moment the contrast between him and my former commanding officer. I was much moved, and said in reply, that it ‘was not my fault there were so many sick in the 88th regiment; all I could do was to cure them as fast as I could,’ and as to not one-half of them being sick, I affirmed that every one in the report in his hand was sick. In the sharpest manner, and with an oath, he said they could not be, and that malingerers were deceiving me. I, as positively, and in warm terms, denied this; and I added that so long as the regiment continued in its present state the sick would increase and they would soon be doubled. He asked what I meant. I said that the irregularities which prevailed would occasion an increase, and from the filthy state of the temporary barracks—which at the same time were not weather-proof—they were a nursery for disease. He desired me to make good my words, and, hurrying out with the quartermaster and adjutant, he went through all the barracks, cooking houses, &c., making a minute survey of each, loudly and angrily calling as he passed through each for the officers of each company, and giving no small amount of abuse to most of them for not having strictly reported the state of things. When, after hours of this unpleasant duty, he had gone through the whole, I begged that he would now accompany me and see the only place over which I had jurisdiction—the hospital. He passed in silence through the different wards, but this I felt I could not permit. I called upon him to say if he found fault with the condition of things here; he confessed he could not. He did more, for when he went out he desired the officers commanding companies to go in, as he had done, and view the comfort men could be placed in, and mark the contrast. Still he did not express himself satisfied, and I fancy he felt my

discontented, cool manner towards him. Seeing the different kind of life I was likely to lead under such a man, I determined to exchange into another regiment."

About this time his brother, who was then lieutenant in the 90th regiment, came on a visit, and Colonel Beresford took a great fancy to him and told McGrigor he would like to have him as one of his officers. McGrigor then informed him of the steps he had taken to effect an exchange into some other regiment, where, he hoped, his exertions would be better appreciated.

"Nothing further passed; but in an hour or two after he sent for me to his quarters, took me by the hand on entering, and expressed his sorrow if, in the dissatisfaction he felt at the state in which he found the corps on his joining, he had spoken warmly to me, for that really my department of it was the only one of which he could say anything favourable, and that he had so reported to the Horse Guards. In short, we became friends, warm friends, and continued so ever after."

Minutely careful, conscientious and assiduous in the performance of his duty and glorying in his work, McGrigor keenly resented any imputation on its quality, and would brook no reprimand which he thought unmerited. He asked, however, for no more recognition than he was prepared to grant to others who deserved in like degree; and his temper was as generous as it was hot, whilst straight dealing and straight talking were ever the quickest way to his affections.

The chapter of accidents which led to his sailing alone to the West Indies, so escaping capture and imprisonment by the French, being mourned as dead by his regiment, and his subsequent re-joining them on active service in Grenada, must be read in the original to be appreciated. Incidentally, he gives a vivid account of the condition of the troops in action and of the medical service in the West Indian campaign; of the feelings of personal enmity and exasperation which prevailed, and of the implacable severity, not to say cruelty, with which the rebellion was quelled. Active operations were immediately followed by an appalling outbreak of disease. Yellow fever and dysentery ran riot, and when the conditions under which the troops were housed is realised, there is little room for astonishment. But quiet having been restored, the 88th were ordered home. The hurricane season was approaching, so to save the insurance they were hurriedly embarked on a crazy ship, with insufficient provisions and no comforts of any description. Notwithstanding a minute preliminary inspection

yellow fever broke out on board. The captain and a number of the crew died, whilst daily some of the soldiers succumbed. There was neither bread nor biscuits, a little rice only, and salt and fresh pork. The weather was stormy, the ship unseaworthy, and the acting captain incapable and usually drunk. Such were the conditions under which our troops at that time travelled at sea. Yet in time they reached Cork.

A short period at home—part spent in aiding to suppress the naval mutiny at the Nore—intervened before the 88th were ordered to India. The headquarters embarked on Christmas Day, 1798, reached Bombay about the middle of May, and were quartered at Colaba, where McGrigor immediately built himself a commodious bungalow, became immersed in the study of the local diseases, and “quickly accumulated an hospital full of sick, the prevailing diseases being dysentery and hepatitis.”

In less than a year came another move—this time to Ceylon—for special service and an unknown destination. A force was gradually concentrated there; it was thought, to proceed to Batavia and Manila, but to the great joy of those concerned their orders were changed and they were directed to form part of an expedition to expel the French from Egypt. This meant returning to Bombay, whence the expedition was to sail. McGrigor was appointed head of the Medical Staff, and as the force was a mixed one of British and Indian troops, he required a commission from the Hon. East India Company. This was bestowed upon him, and he thus became the first Principal Medical Officer of a force composed of King's and Company's troops.

In this capacity he was presented to Colonel Wellesley, who was to command the expedition. This was McGrigor's first meeting with the Chief whom he was subsequently to serve so well in the Peninsula. But Colonel Wellesley was then in very bad health, and was unable to go with the force, the command being given to Brigadier-General Sir David Baird.

The expedition sailed from Bombay; beyond the extreme prevalence of Guinea worm amongst the men, there is little of medical interest to note until the disembarkation at Cosseir. Here McGrigor's duties as Principal Medical Officer became very exacting. He was obliged, having no assistant, to retain the medical charge of his own regiment, in addition to performing the multifarious work of a superintending medical officer, in the midst of disembarkation, in exceedingly hot weather, at a place with none of the usual resources. His duties were not lightened

by the covert opposition of some of his medical brethren, who resented his having been given such a prominent position. However, by his usual persistence and kindly tact he was able, as on other occasions, to obtain co-operation and support without sacrificing friendly relations.

His position of seniority was, however, only a temporary one. With the troops sent from the Cape to join Sir David Baird came a medical staff from England, with Dr. William Randle Shapter<sup>1</sup> as Inspector of Hospitals. This gentleman took over the appointment of Principal Medical Officer on arrival, but as his knowledge of the ways and organisation of the Indian troops was scanty, it was arranged that McGrigor should continue to supervise the medical arrangements of the latter, until the force should join with the English Army in Lower Egypt.

It is in anomalous positions of this kind that McGrigor seems to have shone in his younger days ; his innate courtesy and ready tact disarming opposition and reconciling even those who thought themselves aggrieved by his advancement. His devotion to duty and high professional attainments helped to consolidate a position which was not altogether based on the claims of seniority.

On Sir David Baird reaching Lower Egypt and combining with the English Army, McGrigor was obliged to resign the medical superintendence of the Indian portion of the force and return to his regiment. But after a very short space of time, the greater part of the English Army received orders to return home, and, at the earnest request of Sir David Baird, Dr. McGrigor resumed the medical control of the Indian forces.

His first endeavours were to meet the onset of plague, which was prevalent in the neighbourhood, though it had as yet spared the troops. McGrigor knew such immunity could not be long lived, and had all his arrangements for isolation hospitals, segregation of infected troops, quarantine, and the formation of a Board of Health, ready for the coming of the pestilence, when come it did. Its period of prevalence was one of long, strenuous, unremitting exertion on the part of the Principal Medical Officer, and is described in a report which he subsequently published entitled "Medical Sketches of the Expedition from India to Egypt."

Only by the strong impression of his individuality on the General Commanding was such intelligent appreciation of coming events made fruitful. McGrigor deserves the credit of getting done what others under like circumstances only got talked about.

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<sup>1</sup> Died at Bath, November 2nd, 1833.

On the cessation of hostilities with France the Indian contingent was ordered to return from Egypt to India, and McGrigor, to his great satisfaction, went with it as Superintending Surgeon. In this capacity it became his duty to make the medical arrangements for the return march across the desert and for the re-embarkation of the Army. The latter was complicated by the reappearance of plague, necessitating steps for a period of quarantine before the troops could be permitted to land again in India. "Butcher's Island," just outside Bombay, was designated as the chief quarantine station, through which every returning body of troops was obliged to pass. The Medical Board in Bombay appointed McGrigor Superintendent of Quarantine, a lucrative but lonely post, involving solitary residence on the island so long as the period of quarantine should last. For several weeks he lived among his books, his one visitor being the captain of a sloop of war, who came on shore daily for a walk.

On the break-up of the quarantine establishment, he returned to Bombay and plunged at once into medical work and study, resuming his position in the front rank of the profession in that city, and maintaining it until the two companies of his regiment there were ordered to rejoin headquarters in England.

It is passing strange to think that in those days, when it took some four months or more to get from England to India, two companies of a regiment should be on detachment in Bombay, the headquarters being at home.

Once more at home McGrigor returned to his regimental duties, and found the position a little irksome after the wider responsibilities he had borne. He had now been eleven years in the Connaught Rangers, the only Scotch officer in the regiment, and was held by all ranks in high affection and esteem, feelings which were fully reciprocated by him. It was, therefore, with profound regret, that in February, 1804, he took leave of his old comrades, and was gazetted to the Royal Regiment of Horse Guards Blue, in which he thought he would have greater professional opportunities and scope for advancement. He joined them in Canterbury, whence they moved to Windsor.

During his sojourn at Windsor, as an officer in the "Blues," he was brought into personal relations with the King and Royal family, including the Duke of York, then Commander-in-Chief, who had not forgotten their previous meeting at Nimeguen, and who had now an opportunity of observing at first hand his exceptional capabilities, an opportunity which was not neglected, as subsequent events will show.

At this time it was proposed to institute a fourth Presidency in India, to include all the Eastern islands, the seat of Government to be at Palo Penang. Mr. W. Dundas was to be the head, and he was anxious to obtain Dr. McGrigor as Chief of his Medical Service. An offer of the appointment was accordingly made and, as the post was a very lucrative one, was accepted by Dr. McGrigor, but was subsequently prudently declined when it was made plain how unjust it would be to supersede the whole body of the Company's medical officers. McGrigor was not to remain much longer at Windsor. How he came by the knowledge of the change in his circumstances is sufficiently quaint to be told in his own words. "One morning, whilst I was at breakfast, the adjutant of the Blues came into my room and surprised me with a most unlooked-for piece of intelligence. By the desire of the King, instead of a commissioned officer to attend His Majesty as orderly officer daily at the castle, a corporal of the regiment had been substituted for that duty. The non-commissioned officer was daily relieved about breakfast time, and after His Majesty had dressed. The corporal who had come off duty had just arrived and reported himself to the adjutant. The news he brought was that the King, while he was being shaved, addressed the corporal (a very respectable and intelligent man, as all the non-commissioned officers of the corps were), and among other things said: 'You are about to lose your surgeon in the Blues; I have this morning signed a new commission for him on his promotion.' As this intelligence greatly surprised me, the adjutant sent for the corporal, who related to me what had passed between him and the King."

When the *Gazette* appeared it was found that McGrigor had been promoted to be Deputy-Inspector from July 2nd, 1805, a very unusual, though not an unprecedented, rise.

To understand the significance of the appointment it is necessary to know how the medical concerns of the Army were then administered.

At the head of the Medical Department was a Board consisting of the Surgeon-General to the Forces, Mr. Thomas Keate<sup>1</sup>, who had been surgeon of one of the regiments of Foot Guards, the Physician-General, Sir Lucas Pepys, Bart.,<sup>2</sup> a civilian, and the Inspector-General, Mr. Francis Knight,<sup>3</sup> who, like the Surgeon-General, had been a surgeon in the Guards.

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<sup>1</sup> "Dict. of National Biography," xxx., 273.

<sup>2</sup> *Ibid.*, xlv., 359.

<sup>3</sup> Inspector-General, December 27th, 1801.

These gentlemen divided amongst themselves the patronage of the Medical Department of the Army—the Physician-General and Surgeon-General appointed to all offices of the hospital staff, the regimental medical appointments being the province of the Inspector-General. It may be remarked that not one of the three had any experience with troops in the field. Mr. Knight owed his appointment to the very excellent system of economy and supervision which he had instituted in his regimental hospital, a system which was afterwards extended to the Brigade of Guards and which the Duke of York wished to see introduced into the regimental hospitals of the whole Army.

In order to introduce this system generally and to keep it on the right lines, inspectorial officers were appointed—"inspectors of hospitals" for the larger commands and "deputy-inspectors" for those of less extent. McGrigor was appointed one of the latter. It is his merit to have seen how an appointment, which was instituted to keep a rigorous check over expenditure and hospital supplies, could be utilised to stimulate the professional zeal of medical officers and excite their interests in the scientific side of their duties. He had long noticed that the Board in its communications with its subordinates was much more interested in questions of economy than in subjects of professional importance; medical officers were degenerating into accounting clerks, and "he was most applauded who was the most correct in accounts and the greatest economist in oatmeal, salt, barley, &c." From the first he determined to redress the balance so far as lay in his power.

His first charge was the Northern District, where he joined the staff of General Vyse at Beverley. The position he held was not rendered easier by his having superseded many of his seniors, but he behaved with such tact and consideration as to win their regard. He exerted himself to gain the confidence of every medical officer in his district, and helped each all he knew. Soon the visit of the Inspector was no longer dreaded but welcomed and looked for. Severity he reserved for those who were negligent or wilfully ignorant, and to those he could be stern, but it rarely happened that he had to resort to harsh measures. A bond of fellow-feeling sprang up in the command, and the medical officers responded readily to his efforts to excite their professional enthusiasm. He constantly directed their attention to novelties and improvements in medical practice, which they took up with zest. The standard of medical work in the military hospitals was immeasurably raised, and the example so set was such as to hasten the introduction



of similar improvements into civil hospitals, dispensaries, and poor-houses; so wide was the influence of one earnest enthusiastic worker.

The conspicuous success of his efforts had the inevitable result of removing him to a wider sphere, and at the instance of the Duke of York he was sent to superintend the medical arrangements in the south-west district, one of the largest in England.

His new General was H.R.H. The Duke of Cumberland, a most rigid disciplinarian of the old school. It is interesting to note that his Adjutant-General, Major, afterwards General, Thomas Foster,<sup>1</sup> entered the Army as a medical officer and had attained the rank of apothecary to the Forces when he commenced his career as a combatant. By additions his district gradually grew until it became the largest in the kingdom.

McGrigor had now full scope for his energies. At Portsmouth he had to supervise all embarkations and disembarkations, to fit out all expeditions with their medical requisites, to pay all medical officers proceeding on service and to overlook a large general hospital in the Isle of Wight, as well as the great dépôt for ophthalmia and other eye diseases, often containing as many as 1,000 patients.

His travels extended from Portsmouth to Pembroke and from Brighton to Dorchester and Weymouth.

His predecessor had been slack, and discipline in his hospitals was lax. By hard, strenuous, unremitting labour he in time mastered his task, and established the same friendly relations between himself and his medical officers as had previously existed in the northern district.

On the top of these multifarious duties came a stupendous task. The battered and shattered remains of Sir John Moore's victorious army from Corunna was landed at Portsmouth, and it fell to McGrigor to find accommodation for their sick. Crowded on board the transports, with no attempt at order, weak from the privations of their cruel retreat, they fell easy victims to the typhus which they had embarked with them.

By the time they reached Portsmouth the number of cases of fever amongst them was appalling. After occupying all the ordinary hospital accommodation and converting barracks into hospitals, McGrigor applied for the use of the naval hospital at

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<sup>1</sup> Apothecary to the Forces, April 9th, 1794; Lieutenant-General, November 23rd, 1841.

Haslar, which was granted. Still the fever cases overflowed into floating hospitals, made up of transports and prison ships, and other unsuitable hulks. To find medical attendants for this large number was in itself no mean task, and even McGrigor's insatiable appetite for work must at this time have been glutted. Typhus fever spread to the militia and other troops quartered in Portsmouth and the surrounding country. It was long before the hospitals could be cleared and restored to their normal condition. McGrigor's organising powers shone out in coping with an emergency which would have daunted many another man, and his reputation grew as the foundation on which it was based became better known.

His services now were in great request. War was being waged in the Peninsula on a large scale. Lord Beresford had been appointed to the command of the Portuguese Army, and being fully alive, from old regimental associations, to McGrigor's value, applied for him as Inspector-General to reorganise the Portuguese medical service. The request was granted, but before McGrigor could take up the appointment he was required in another and even more urgent and important sphere. Our army in Walcheren was in a parlous condition. It was prostrated by malarial fever of such severity as had never previously been experienced. The Army was paralysed. The camp was one vast hospital and Sir John Webb, the Principal Medical Officer, was reported dead. In these circumstances McGrigor received orders to proceed with all possible speed to the spot and take over the direction of medical affairs.

Once more he had a stupendous ordeal to face, but his powers were now ripe, he had confidence in himself, and knew full well what he wished done and how to do it. Overcrowded hospitals, insufficient staff, depleted stores, and disordered accounts, were what met him. Gradually he evolved order out of chaos, redistributed his sick staff, replenished his stores by purchase and requisition, and took steps to rescue his accounts from the almost inextricable confusion into which they had fallen.

But the sick rate did not diminish, and at length Government decided that, owing to the great mortality, one of the members of the Medical Board should personally visit the scene to investigate the condition of affairs and report to the Government. The Physician-General, Sir Lucas Pepys, was ordered to proceed thither, but he declined, on the plea that he was unacquainted with the diseases of the soldier in camp and quarters. Neither of his colleagues volunteered to go. This completed the discredit of the Board as then constituted. It had incurred the ridicule and

contempt of those it ruled as well as of the public, and Parliament gave expression to the general feeling of indignation.

In default of a member of the Medical Board the Government appointed a Commission consisting of two old and experienced military medical officers, and Sir Gilbert Blane, an old naval medical officer, and at that time an eminent physician in London. These three gentlemen paid a visit to Walcheren and remained a few days. They saw the pitiable plight the Army had been reduced to and the vast amount of sickness and high mortality, and, recognising the pestilential nature of the country, could make no recommendation other than the withdrawal of the troops from such a death-trap. As it was apparent that the value of the Army as a fighting machine was utterly broken, the necessary orders were issued from England and the troops were sent home.

This campaign is one of the classical examples of an army being destroyed by disease through a want of knowledge and a consequent neglect of sanitary precautions. It was attended with the usual Committee of Investigation, as we have seen, and followed by a Parliamentary Enquiry, before which McGrigor had to give evidence. As a result of this Enquiry the old Medical Board was broken up. It was, at last, realised that gentlemen, however eminent, engaged in private practice in London, with little or no knowledge of the Army, and none of foreign service with troops, could not satisfactorily manage the affairs of a military department; especially as appointments on the Board were chiefly sought for the valuable patronage they carried with them and for the opportunities they gave for extending the holder's personal acquaintance and private practice. The time given to the deliberations of the Board was the scanty leisure allowed by busy practice. It was therefore decided that the members of the new Board should be persons of extensive first-hand knowledge of the Service and who had served abroad with troops.

McGrigor returned to his position of Inspector-General of Hospitals in the Southern Command, and at this time married the sister of his old friend Sir James Robert Grant.<sup>1</sup>

Marshal Beresford was still anxious for his services, but under his new circumstances the Portuguese Army seemed less attractive and he exerted himself to get a friend appointed in his place.

In May, 1811, his son was born, and he looked forward to a

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<sup>1</sup> Inspector-General of Hospitals, K.H., 1816; Knight Bachelor, 1819; C.B., 1849, Principal Medical Officer at Waterloo.

spell of domestic quiet and comparative rest. But it was not to be. As stated in the commencement of this paper, there was now need of a strong and capable medical administrator with the Army in the Peninsula, where Wellington was engaged in his epic struggle.

McGrigor's special qualifications for the post were too obvious to be overlooked. Our readers will agree that the Commander-in-Chief took no risks when he made the appointment and assured Lord Wellington that he would be well satisfied. At any other time the chance would have been welcomed with enthusiasm, but under his altered circumstances McGrigor could have wished it delayed. But he set himself at once to collect such information as the records afforded concerning the state of the Army with which he was to serve and the duties he was to undertake. His wife was anxious to accompany him to the seat of war, a practice not uncommon in those days and not unknown at a later date, but he had seen enough of ladies in the field to veto the arrangement. "I knew full well that with the care of my wife and child I could not do my duty in the way I had determined it should be done while I remained in the Service."

In company with his secretary, Dr. James Forbes,<sup>1</sup> staff-surgeon, and four clerks, McGrigor arrived in Lisbon in January, 1812, and at once attacked his work with characteristic energy.

A close investigation of the store accounts brought to light great irregularities, to remedy which immediate steps were taken.

Lisbon was choked with an immense number of sick men from the Army, with a vast number of sick, or reported sick, or wounded officers, requiring an undue number of medical officers to look after them. The condition of affairs was a scandal, had provoked most unfavourable comment in England, and was depleting the Army in the field of *personnel* who should have been sharing the duties. The drain was most serious from the military point of view, as the fighting force was being weakened by the passage of such large numbers to the base, from which it was exceedingly difficult to get them sent back to the ranks. In fact, a state of things had arisen which inevitably must arise in any campaign where the medical service is inefficient and its supervision and discipline lax.

McGrigor took time to complete his survey and then submitted his report to Lord Wellington. It "related to the very great

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<sup>1</sup> Afterwards Inspector-General of Hospitals: "Dictionary of National Biography," xix., 398.

accumulation of sick and to the still greater accumulation of officers, their ladies and the wives of soldiers at Lisbon, which detained a disproportionate part of the medical officers of the Army. My repeated inspections of all the hospitals, and of a great many of the officers, convinced me that Lisbon was so very agreeable a residence that many officers and soldiers would be slow to resume their duties in the field, and that it was a much more attractive station for the medical officers themselves than the divisions of the Army about Ciudad Rodrigo in an inclement season of the year." He made three proposals:—

(1) That in future only special cases of wounds or sickness should be sent to the rear, and such only as should be approved by himself. That each corps should have a small hospital of its own, where all slight cases should be treated by the regimental medical officers under the supervision of the principal medical officers of the divisions.

(2) That all sick and wounded officers should be treated in like manner.

(3) That no sick or wounded should be sent to Lisbon except those to be ultimately sent to England; that all the medical officers should be ordered up to the Army except the small establishment indicated for the Lisbon duties.

A statement of the number of sick in Lisbon, with proposals to send all the inefficient to England and the remainder back to their regiments, completed his recommendations.

On receiving the report Lord Wellington immediately sent McGrigor a cordial letter of thanks and desired him to join headquarters with as little delay as possible, inspecting the hospitals at Coimbra and Celerico and others on the line of route.

This McGrigor proceeded to do. But Coimbra and Celerico were extensive hospital establishments, neither in the best condition, and time was required to investigate them thoroughly and indicate the necessary measures of reform. Meanwhile Wellington was impatient to meet his new Medical Director and kept sending messengers to hasten his arrival. McGrigor complied with the best speed he could, and finally reached headquarters. Wellington, who had not forgotten meeting him in Bombay, received him most kindly, kept him to dinner, chaffed him about the predatory exploits of his old regiment, and before letting him go said he would be glad to see him on business in the morning.

On his first interview Wellington expressed his great pleasure with what had been done in the hospitals at Lisbon and Coimbra,

and stated that he had much wanted an officer such as he had now obtained, who thoroughly understood the duties and was acquainted with the habits of soldiers and who would prevent the malingering propensities of both officers and men at the hospital stations, where all sorts of irregularities prevailed, and he promised his utmost support, which from that moment was fully given.

"His Lordship dwelt on the little support he received from some of the heads of departments, whom he freely named, saying he had to do their duties as well as command the Army. I replied that it would be my endeavour to prevent his having that trouble with the medical department of the Army. We parted on the best of terms, and he desired me to come to him every morning at the same hour, with the other heads of departments, the Adjutant-General, Quartermaster-General, and Commissary-General.

"On my appearing the second morning, I found in the outer apartment the Commissary-General, Sir Robert Kennedy, and Adjutant-General, Brigadier-General Stewart (the late Lord Londonderry, with his book under his arm), who, coming up to me, said it was unnecessary for me to come to Lord Wellington, that I might come to his office and he would transact my business for me with his Lordship, whom it was unnecessary for me to trouble. I replied that I preferred doing business directly with Lord Wellington, and that it was by his lordship's desire I came there. At this moment the door of his little inner apartment was opened by Lord Wellington, who, nodding to me, desired me to come in.

"After this I daily made my appearance to take his orders and to make my reports on the numbers of sick and wounded, with all the details of their movements. These reports I made to his lordship ever afterwards, whether in the field or in quarters, immediately after his breakfast, which was the time he fixed for seeing the Adjutant-General and Quartermaster General, the Commissary-General, myself, and occasionally the Paymaster-General and the head of the Intelligence Department, when at headquarters. At this time he gave me notice of movements and after my giving him a statement of the total sick and wounded of the Army, I gave him the total in each hospital station in Portugal, Spain, and afterwards in France, and the total number of dead; the number fit to be marched to their regiments or convalescent, the cases or diseases, with the causes of these, and in fine everything relating to the health department of the Army."

To enable McGrigor to give the above information, it was

necessary for him first to institute a simple but regular system of returns, which had been neglected by his predecessors.

He took an early opportunity of discussing his reports from Lisbon and Coimbra. Wellington entirely approved of the breaking up of the great dépôt of sick officers at Lisbon. Orders were issued that no wounded or sick officers or men should be sent to the rear except on the proceedings of a Board of Medical Officers, which were to be submitted for approval.

It was further ordered that after the arrival of officers or men at Lisbon they were immediately to appear before another board, and if not recovered within a limited time were to be embarked for England. Lord Wellington at once saw the great advantage of this proposal, in the additions it would make to his none too crowded ranks, whilst in addition it cut at the root of the great abuses then existing at Lisbon.

But the suggestion that each regiment should have its own hospital for the treatment of the lighter cases of illness did not meet with the General's acquiescence. He saw its advantages, but did not think they were sufficiently great to outweigh the drawbacks, which he feared, of diminishing the mobility of his column. For the time the suggestion was dropped.

The interval before the advance on Badajoz was spent in slowly consolidating the new *régime*. Stringent investigations were made into the provision and issue of stores, the material of all corps was replenished, and dépôts were established at suitable places. When the movement began the medical preparations were complete. McGrigor inspected each division as it passed. He made himself acquainted with his *personnel* and the way in which they were disposing of their sick. Regimental Commanding Officers as well as Medical Officers deplored the necessity of sending their light cases to the rear, but having no authority they feared to incur censure by carrying any along with them. It must be remembered there was no medical organisation at that time between the regimental surgeons and the stationary hospitals on the line of communication. McGrigor gradually encouraged the use of local transport, where it could be obtained, for the carriage of men likely to rejoin the ranks in a few days, and where such transport would not delay the forward movement.

Arrived before Badajoz, McGrigor established his office at Elwas and rode over daily to see and report to Lord Wellington, but the latter was anxious to have him in closer touch and ordered a tent to be pitched for him contiguous to his own. McGrigor's earliest

steps were to establish field hospitals in touch with the besieging force, and he induced Lord Wellington to attach to each corps employed in the siege two spring wagons for the daily transport of their sick.

The momentous night of the final assault approached. On April 6th the breach was pronounced practicable, and those at headquarters knew the attack would take place that evening. McGrigor determined to post himself near his chief so that he might at once receive any orders given, and also that he might be on the spot should any mishap occur to the General. His description of that night, with its alternation of fear and hope, and its accumulation of horrors, has become a classic. As one reads the whole terrible scene is brought vividly before him. There are few more clearly-cut literary pictures than the one of Wellington, his countenance lurid in the light of the torch held by his A.D.C., jaw dropped and visage lengthened, but with firmness still written on his face as he peered through the darkness and strained his ears to catch how the fate of the fight was faring.

When the castle was won McGrigor followed Wellington through the main breach in the wall, and was a witness of the horrible excesses of our infuriated soldiery, mad with drink and with the recent rage of battle, seeing red, and oblivious to all the calls of discipline and humanity. It is a picture one would gladly blot out, as unlikely ever to recur, were there not more recent instances to show that human nature has not vastly changed with the flight of years.

McGrigor's object in entering the fortress was to ascertain so far as possible the number of wounded, and the nature of their wounds. Gradually he got reports from the regimental surgeons, who were working at high pressure. After visiting many of the wounded officers he returned to camp "not a little exhausted" to make his report to Lord Wellington. What follows is of sufficient importance to be textually quoted:—

"I immediately made my way to Lord Wellington and found him in his tent writing the despatch. He received me most cordially, and after I had given him my detail thanked me much. He was in excellent spirits; I therefore said: 'I trust, my lord, you are satisfied that the medical officers during last night did their duty, as well as the military officers, and that you will receive my testimony that they discharged their arduous and laborious duties most zealously, and often under circumstances of personal danger, of which they were regardless.' He replied that he himself



had witnessed it. I then added : 'Nothing could more gratify those officers, nothing could be a greater incentive to their exertions on future occasions than his noticing them in his public despatches.' He added, 'Is that usual?' My reply was : 'It would be of the most essential service,' and I ventured to add that really their extraordinary exertions gave them, in justice, a claim to this. He rejoined, 'I have finished my despatch ; but, very well, I will add something about the doctors.' "

When the Gazette appeared the medical officers in the Army in England saw with delight that the merits of their brethren had been publicly acknowledged in the same manner as those of the military officers. This was the first time that their merits had thus been publicly recognised, and the example of Lord Wellington has been followed after every great action that has since been fought ; some time afterwards the Navy followed the example.

It is services such as this, typical of the intense pride he took in the work of his department, of his full appreciation of the exertions of his officers, and his constant solicitude that their trials and labours should be adequately recognised, which endeared McGrigor to those who were privileged to serve under his direction. He was no light taskmaster, but his officers grudged no work on on his behalf, conscious that it would be generously acknowledged, and that nothing was exacted from them which was not for the glory of their calling and the benefit of the Army at large. This visible but intangible bond of sympathy was the mainspring of the unusual state of efficiency which the medical service admittedly reached during the later phases of the Peninsular war, an efficiency which, during the disorders of the retreat from Burgos, wrung from Wellington the exclamation : "The medical department is the only one which will obey orders ; on them I can rely for doing their duty."

A lull, in which military operations were at a standstill but in which the stress on the medical service was severe, intervened between the capture of Badajoz and the campaign culminating in the decisive victory of Salamanca. After the latter Wellington entered Madrid, which Joseph Bonaparte had just quitted, and was received with boundless enthusiasm.

In the "Life of Wellington," by R. G. Gleig, M.A., Chaplain to the Forces, and a close friend of Wellington, we read : "McGrigor had remained behind after the battle of Salamanca to provide for the wants of the sick and wounded, which he did

zealously. He arrived in Madrid some time after the first burst of exultation had subsided, and proceeding to make his report to the Commander of the Forces, found him sitting to the artist who had been commissioned to paint his portrait. The Marquis listened in silence until McGrigor began to describe how he had ordered up purveyors and commissariat officers from the rear with supplies, and then the suppressed volcano burst out. The Marquis sprang to his feet and demanded what right Dr. McGrigor had to do that. The Doctor's assurance that nothing else would have saved many valuable lives seemed to make no impression upon his auditor. Neither was the Marquis mollified by a reference which McGrigor made, with doubtful discretion, to the outcry which had been raised in England when the wounded were abandoned after the battle of Talavera. 'I shall be glad to know,' exclaimed the angry Marquis, 'who commands this army, you or I? I establish one route, one line of communication, and you establish another, and order the commissariat supplies to move by that. As long as you live, sir, never do that again; never do anything without my orders.' 'But, my lord, the case was urgent; there was no time to get your orders.' 'That don't signify; never act again without orders, be the consequences what they may.' So spoke the great man in his anger, unreasonably as angry men always do; yet such a fit never lasted very long with him, and on the present occasion he soon showed, in his own peculiar way, that he was conscious of his error. He sat down, and almost before the painter could resume his task, said to McGrigor in a tone more than usually kind, 'Come and dine with me to-day. You'll meet the guerilla chief "El Medico"; who knows but what you may get something out of him in your own profession worth remembering.'"

Retribution followed swiftly. Wellington's next exploit was the ill-starred siege of Burgos. He was unable to make any impression on the Castle, and a month spent in futile attacks resulted only in a heavy loss of men and great discontent in the force. Wellington was himself fretted and anxious, everything seemed to go wrong. Let us again quote from Gleig. "He (Wellington) was dissatisfied with himself and with everybody else, and spoke harshly to all who approached him. Dr. McGrigor, among others, came in for his own share of sharp words, which the Highland pride of the Chief of the Medical Staff bore with difficulty. This was early in the day preceding the commencement of the retreat, and McGrigor returned to his quarters sick and sulky. By and by a message came that Lord Wellington

desired to see him that evening ; but the Doctor was still in high dudgeon, and feeling really unwell he made the most of his illness and refused to attend. At an early hour next morning, however, he proceeded to Lord Wellington's house and found that about 3 o'clock the Marquis had mounted his horse and ridden off to the front ; McGrigor followed. The English Army was under arms in the expectation, as it appeared, of being attacked, and Lord Wellington stood on a hill with a numerous staff about him searching the French lines with his telescope. No sooner was McGrigor's name pronounced than the Marquis put up his telescope, and, taking the Doctor by the arm, led him out of the crowd. What followed can best be told in the words of one of the actors in the scene. He said, 'We can't keep Madrid ; Hill is overpowered and marching to join me, and I must be off this very night. But what is to become of the sick and wounded ? I fear they are very numerous, and there are many wounded who can't be moved. What do you propose to do ?' I replied, 'I was happy to inform him that our sick and wounded were not numerous, that seeing how his mind was occupied with the siege I had taken it upon myself to get carts from the commissariat and to employ them, and the mules which brought up provisions, in removing the sick and wounded to Valladolid.' 'Very well, indeed,' was the reply ; 'but how many have we in Burgos ?' 'Not more than sixty, and those mostly too bad to move.' 'Admirable ! I shall be off to-night ; let nobody know this from you and make your own arrangements.'

Gleig adds : "Did the Marquis remember then what had passed between him and Dr. McGrigor when they discussed at Madrid a question somewhat similar, or was he like all really great men able and willing to contradict himself when an occasion arose that demanded that sacrifice ?"

It was said at the time by many officers who had taken part in both that the retreat from Burgos was little if any less disastrous than that of Moore to Corunna, in the losses it entailed. The number of sick became enormous. Further, medical officers were demanded from England, and, as a stop-gap until their arrival, McGrigor took into employ all the Spanish medical officers he could find, and as many of the French medical officers, our prisoners of war, as would accept service at the English rates of pay. As these rates were considerably higher than their own, few refused ; but both Spanish and French proved but poor substitutes for his own officers. Accommodation was found by

instituting regimental hospitals in cantonments, under the supervision of the principal medical officers of divisions, a step McGrigor had long wished to be allowed to take. At the same time he arranged with Lord Wellington for the despatch from home of a number of hospital huts in readiness for erection for the coming campaign.

Slowly the Army recuperated, but before the next campaign opened, to Wellington's delight, the number of convalescents to rejoin their regiments from the hospitals was greater by thousands than he had from previous experience expected. This was attributed to the extraordinary exertions and unusual efficiency of the medical service, whose zeal had been further stimulated by the free promotion of deserving officers which, on McGrigor's recommendation, Wellington had successfully pressed on the authorities at home. It was to this great addition to Wellington's force that Napier alluded when he said that the fortunes of the day at Vittoria might be truthfully ascribed to the exertions of the medical service, it having added a full division to the strength of Lord Wellington's army, without which he might not have risked an action. What greater reward could any military medical administrator ask for than the expression of such an opinion by one well qualified to form it?

Altogether the picture of medical affairs in the later phases of the Peninsular War is one a medical officer likes to dwell on: A capable chief, in intimate relations with and possessing the entire confidence of the supreme commander, with a body of officers devoted to him and to their work, eager and able to second him to the full in his endeavours to promote the fighting efficiency of the Army. That much of the success was due to the personality of McGrigor cannot be gainsaid.

The long campaign was now drawing to its victorious close. Vittoria started the French in full retreat, Wellington followed, driving them over the Pyrenees, and storming his way to St. Jean de Luz. Bordeaux fell, and on Easter Sunday was fought the sanguinary battle of Toulouse, followed by the surrender of the town.

These events threw a vast number of wounded on McGrigor's hands, numbers which were increased by the marked preference shown by our Spanish and Portuguese allies for the ministrations of the British surgeons, and by the great proportion of wounded prisoners. He distributed them in two great divisions throughout

the city, placing one under the charge of the celebrated George James Guthrie,<sup>1</sup> then Surgeon to the Forces.

Speaking of the technical skill of his officers at this time, McGrigor says: "After none of the previous battles were more operations performed than after Toulouse, and on no former occasion was more skilful surgery displayed. Great experience and reflection had at this time created among us a body of operators such as never were excelled, if ever before equalled in the British Army."

When peace was declared, McGrigor sought and obtained introductions to Marshals Soult and Suchet, dining with them at Wellington's table. His object was to enlist their interest in getting facilities for him to visit the French military hospitals, which he was anxious to compare with his own. They readily promised their good offices, but, although McGrigor made many attempts and was provided with excellent credentials, he was never able to gain admittance. This confirmed him in the impression which he had formed from common report, as well as from their regulations which he had studied, that they were markedly inferior to his own. One feature in the French organisation, however, he envied, viz., the "ambulance" for the transport of their wounded. He once proposed the adoption of a similar system to Lord Wellington in Spain, but the latter would not hear of it, nor would he give the credit of humanity to Napoleon as the motive for his introduction of it into the French Army. In this Wellington was undoubtedly right. Napoleon was little inclined to hamper his military freedom for the sake of humanity. He adopted the "ambulance" because he found it a help, not a hindrance, to his military operations, increasing, not diminishing, the mobility of his troops. It is strange that Wellington should not have grasped its military value in the same way.

The campaign was over, and McGrigor was preparing for a move homewards, when he received a communication which he describes as the most gratifying incident of his life. It was to the effect that the medical officers of the Peninsular Army, whom he was now about to leave, begged his acceptance of a parting gift from them of a service of plate. What made the gift the more valuable were the terms in which it was offered and the fact that it was made when the donors had no longer any favours to expect, the tie between McGrigor and themselves being about to be broken.

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<sup>1</sup> "Dictionary of National Biography," xxiii., 875.

The gift, of the value of nearly £1,000, was subsequently handed to him in London, and is eloquent testimony of the relations which had existed between himself and his officers.

Passing through Paris on his way home, McGrigor renewed his acquaintance with Baron Larrey, whom he had previously met in Egypt, and met also Baron Percy, who had recently been occupying a similar position to his own in the French Army in the Peninsula, and who, with Larrey, was largely instrumental in the formation of the flying "ambulances" which had excited McGrigor's envy.

From Paris he came home to receive the welcome awaiting him from the Commander-in-Chief and his own immediate superiors. The Duke of Wellington immediately claimed his services, and desired him to continue to see him every morning in connection with Peninsular affairs, which he was then engaged in winding up. He shared in many of the public expressions of gratitude given to the Duke and received the honour of knighthood. Always jealous of the dignity of his profession and of the branch of the Army to which he was proud to belong, he considered the latter recognition inadequate to the services he had rendered, saying quite simply and plainly that if any honour were conferred on him he thought it should be the permanent one of the baronetage. The Duke evidently sympathised with him, but recommended his "taking the knighthood meanwhile."

One morning, after the usual business, the Duke said: "Mac, we are now winding up all arrears with the Government. I have asked them how you are to be disposed of, and I am told you are to be placed on half-pay; but I consider your peculiar services will entitle you to specific retirement."

McGrigor was accordingly placed on half-pay, or rather "retired on an income given for special service," and his future in life became again a question for consideration.

His first step was to resume the study of his profession, and he joined classes in anatomy and chemistry at the Hunterian School in Windmill Street. Two courses were pressed upon him: one, to enter on the practice of his profession as a physician in London, in which his prospects of success were very promising; the other, to submit his name as a candidate for a position on the Medical Board, the senior member of which was then in very indifferent health. The question was early solved for him by his nomination direct to the senior position on the Board. The appointment was one which did credit to the Commander-in-Chief, and gave wide satisfaction in the department.

For the first time an officer in the prime of life, of proved ability, with unrivalled experience and definite ideas of reform, was to preside over the fortunes of the medical service of the Army. An officer who was in every way identified with the interests of that service, who had given it the best years of his life, knew it by heart, and commanded in a degree hitherto unequalled the trust of those who belonged to it. McGrigor accepted the position, not without misgivings, it is true, but with the quiet confidence born of complete knowledge.

Here we must take leave of the fascinating pages of the autobiography which has hitherto been our guide. I make no apology for having followed it as closely as the necessity for compression would allow, and have indeed striven as far as possible to reproduce the *ipsissima verba* of the author. The book is probably now scarce and many may be unable to obtain it. Those to whom the opportunity occurs will, I trust, not miss it.

The record of the remainder of McGrigor's official life is written in his achievements. From the day he first took the chair, slowly but steadily the great work began. "Without haste, without rest," it unfolded itself through the long years of his Director-Generalship. His first great care was to raise the standard of professional education throughout the Service. To enable this to be done on a sure foundation he gradually collected full statements of the education and services of every individual medical officer in the Army, which were drawn up and signed by each.

During the long series of wars in which the country had been engaged great difficulties had been encountered in providing a sufficiency of medical officers of suitable education, and many had perforce been taken whose standard fell far short of McGrigor's ideal. He laid down a minimum standard and intimated to all who did not attain thereto that promotion was barred to them until they had adequately qualified themselves. At the end of the war many medical officers were reduced and many placed on half-pay. The former were chosen from those least qualified for their duties; the latter were informed that their return to the full-pay list would depend on the use they made of their time and on their professional qualifications. They were advised to betake themselves to colleges and schools of medicine at home and abroad, which they did in large numbers. Further, to many of those officers retained on full pay periods of study leave were given, ranging from six to twelve months, to enable them to proceed to some of the schools and add to their qualifications. The effect on the professional

efficiency of the Army Medical Service was immediate and immense. A spirit of emulation was set up which was attended with the happiest results.

The subject next nearest to McGrigor's heart was the collation and use, for the advancement of knowledge, of the enormous mass of clinical and professional material at the disposal of the medical officers of the Army in their widespread stations. He instituted a system of exact returns and reports which laid the foundations of our present statistical records.

A matter which touched him to the quick now that he was the head of the Board was the reputation which the latter had gained for harassing, cheeseparing and unreasoning scrutiny of the smaller details of hospital accounts, at the expense of subjects of professional interest. Of economy in administration he was a master and a warm adherent; of red tape and niggardliness he was the sworn foe. He gradually freed the governing body from the reproach it had justly incurred, and encouraged medical officers to devote their best energies and talents to the professional side of their duties; at the same time insisting on adequate but not unreasonable attention being paid to fiscal interests.

An all-important step which he early took for the professional advancement of medical officers was the foundation at Fort Pitt, Chatham, of the "Museum of Anatomy and Natural History bearing upon Military Surgery," and used his influence with medical officers all over the world to induce them to send specimens to it. Before his retirement it had acquired between 30,000 and 40,000 specimens of different categories, many of them of great value. The collection of human crania exceeded 500 examples, and was held by many competent to judge to be unrivalled. It is still a feature in the museum of the Royal Army Medical College at Millbank, and has recently been commemorated as the "Williamson Collection," to perpetuate the name of Surgeon-Major Williamson, who was mainly responsible for its formation. Within a few years McGrigor attached a library to the museum, to which he himself on one occasion made a donation of 1,500 volumes. All his life he had been a voracious reader and collector, and the library benefited largely from his generosity. Not many years elapsed before 10,000 books had found place upon its shelves, many of which are now to be seen round the walls in the present College.

The exact information he gathered concerning the health conditions of different garrisons enabled him to introduce many sanitary reforms of great importance, and to arrange for the much more advantageous distribution of his *personnel* than had hitherto ruled.



It also enabled him to fight with success for the maintenance of an establishment of medical officers adequate to cope with the work which, he was able to show, lay to their hands. A reform of far-reaching importance, and to which he attached great weight, was the system which he adopted of selecting men for the higher appointments according to the special qualifications they possessed. He found no trouble too great which enabled him to ascertain with greater accuracy the special attributes of officers, likely to fit or unfit them for particular posts. He recognised to the full that the success of the policy he represented depended in large measure on the suitability of the instruments chosen to carry it out, and spared no pains to guard his selections by every possible precaution.

His deep interest in the personal welfare of his officers is evidenced by the steps he took to found and foster the Army Medical Officers' Friendly Society. By means of a comparatively small subscription to this Society the Army Medical Officer was, and is, able to safeguard his widow from the danger of destitution. By example and precept he induced the whole of his medical officers to join this Society, to which the great majority of them continued to subscribe for many years. At the time of his retirement the Society was distributing incomes to 120 widows, and was possessed of a capital of nearly £80,000. Such a thing as an Army medical officer's widow being in dire financial straits was at that time unknown, thanks to this Society and its general support by the officers of the department.

It may be remarked that the Society, under the name of "The Army Medical Officers' Widows' and Orphans' Fund," still exists, has now a funded capital of £120,000, and is able to offer annuities for medical officers' widows on terms with which no outside insurance offices can compete. It is earnestly commended to the attention of medical officers now serving, who do not appear to adequately recognise its advantages.

Instances of distress amongst the orphans of medical officers were still, however, not uncommon, and to help them McGrigor was instrumental in founding the "Army Medical Benevolent Fund." This fund has helped many orphans to complete their education commenced under happier auspices in the lifetime of their parents, and has thus fitted them to take up the position in life to which they could legitimately aspire. The Society was liberally supported by McGrigor and his officers, and when he left office had a capital of £15,000 and distributed an annual income of £500 in grants to suitable cases. The Society still exists

and is doing most excellent service. It cannot be too warmly pressed on the notice of serving and retired officers of the Corps.

These two societies are enduring monuments to the warm human sympathy of McGrigor with those of his brother officers less fortunate than himself. What better tribute to his memory can we make than to keep them alive and active?

McGrigor stuck to his post with the tenacity of his race, but had no wish to "lag superfluous on the stage." After thirty-three years of office, at the age of 78, he began to feel the need of rest, and expressed his wish to retire. But his old friend the Duke of Wellington, then Commander-in-Chief, a youngster one year older than Sir James, would have none of it: "No, no, McGrigor, there is plenty of work in you yet," and McGrigor had perforce to stay. But two years later he renewed his request, and this time with success.

In the letter announcing the acceptance of his resignation the following passage occurs: "The Duke of Wellington has directed me to draw your attention to the expression by the Lords of the Treasury of their high approbation of your long, able, and most meritorious services, and to the testimony which Mr. Fox Maule is desirous of bearing to your merits, and further I am to convey to you his Grace's congratulations on receiving so unqualified an acknowledgment from such high quarters of your unceasing and successful application of your best energies to the discharge of your duty during a long course of years."

In presenting the Army Estimates in the year 1851 the Minister made the following remark: "In the Army Medical Department the service has lost, by the retirement, not, I am happy to say, by the death, of Sir James McGrigor, an officer to whom the public is much indebted," an allusion which was received with the cheers of the House.

When the impending retirement became known to the officers of his department they determined to present him with a costly testimonial, as a token of their regard and regret; but Sir James was altogether unwilling to accept another gift, and, being balked in this respect, they presented him with a valedictory address, in which they expressed their appreciation of the many benefits Sir James's rule had conferred on them and on their service.

During his tenure of office Sir James McGrigor was the recipient of many honours. In 1814 he received the honour of knighthood, in 1831 he was created a baronet, and in 1850 a K.C.B. He was also a Knight Commander of the Tower and Sword of Portugal;

while for his services in Egypt he wore the Turkish Order of the Crescent.

Upon the institution of the London University he was made a member of its Council; he was elected F.R.S. and member of many learned societies in the United Kingdom and on the Continent.

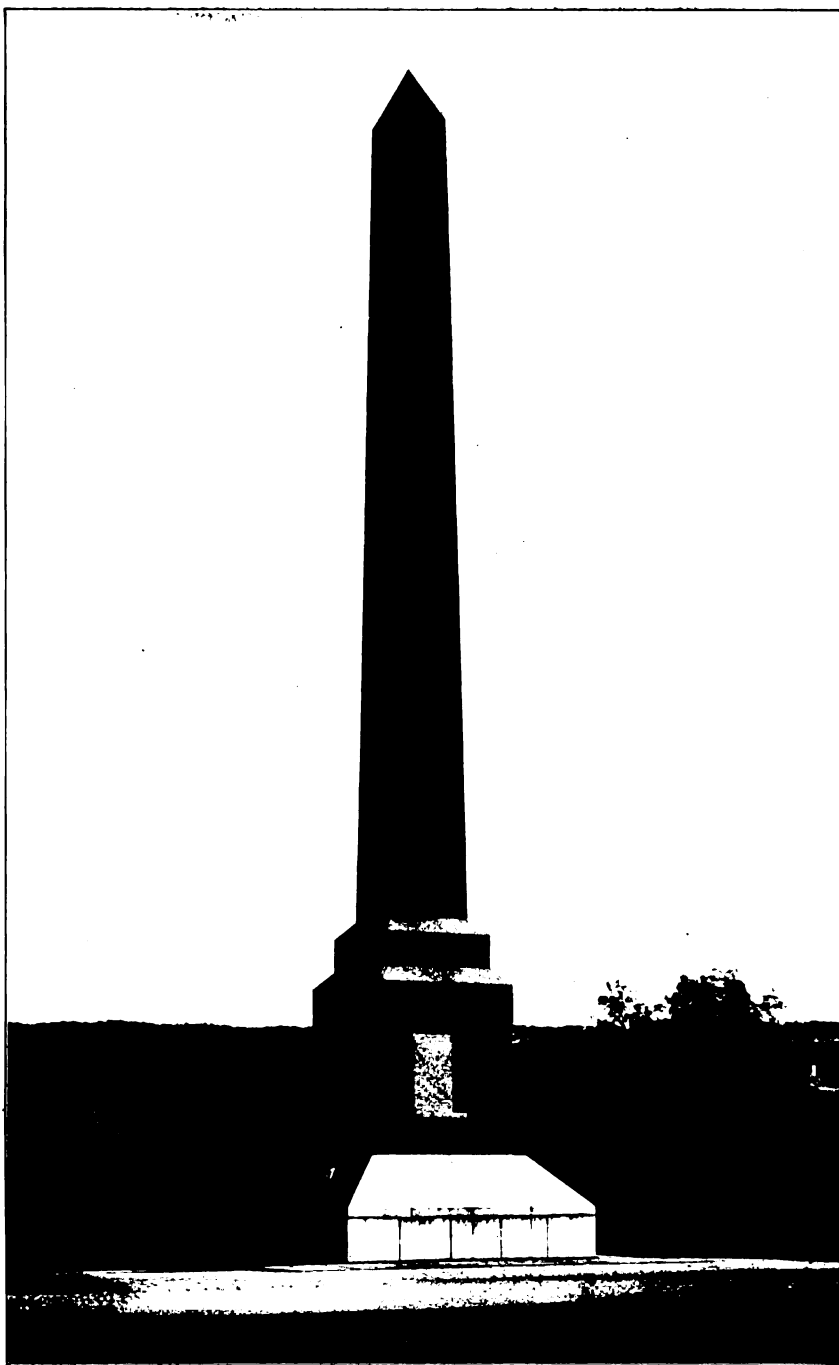
The Marischal College and University of Aberdeen, from which he had obtained the degree of M.D. in 1804, thrice elected him Rector; and the Town Council of Edinburgh conferred on him the freedom of that city.

For seven years longer McGrigor enjoyed the rest he had earned and longed for, happy in the possession of troops of friends to whose number he had been adding every year of his life. He passed away, full of years and honours, in London, in the 88th year of his age, on April 2nd, 1858, having survived the Duke of Wellington five years.

When Wellington College was founded, to McGrigor was assigned one of the niches in the building reserved for the reception of statues or busts of the principal officers, contemporary statesmen, and personal friends of the Duke.

Aberdeen boasts a stately granite obelisk to McGrigor's memory, and opposite the main gate of Chelsea Barracks, in the old Ranelagh Gardens, stood his statue, erected by his many friends and admirers: a statue which we, his successors in the Corps he loved and served, have now claimed the privilege to guard and bring to its rightful home, that college on the Embankment the foundation of which he foreshadowed, and the existence of which is the logical sequence of the policy initiated by him, when he presided over the destinies of the Army Medical Service.

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Obelisk to the memory of SIR JAMES M'GRIGOR, Bart., erected in the quadrangle of Marischal College, Aberdeen, in 1860, and removed to its present site in the Duthie Park, Aberdeen, in 1906.



# EXTRACTS FROM "MISCELLANIES" OF SIR JAMES McGRIGOR.

BY CAPTAIN N. E. HARDING.

*Royal Army Medical Corps.*

IN the library of the Aberdeen Medico-Chirurgical Society, a Society of which Sir James McGrigor was the chief founder, and with which he remained in close and intimate relations till his death, there is a large number of manuscript papers presented to the Society by him some years before his death. I hope to be able to give some account of them at a later date; but they are written in ink which has generally faded considerably in the century or more since they were written, while water has damaged some of them, and, in addition, the writing itself offers not a little difficulty to the transcriber. Meantime I am much indebted to the Council of the Society for permission to make use of them. The following extracts are made solely from one slender volume entitled "Miscellanies."

While Sir James's fame rests securely on his great talents for administration, one has only to glance at his purely professional work to see how excellent was his ability, and how, had he followed his intention of establishing himself in private practice at the close of the Peninsular War, he might have risen to eminence in that walk of life, having already, at the age of 44, firmly established his reputation as an administrator. It will be remembered that he set sail with his regiment, the 88th Foot, from Portsmouth at the end of 1798, and reached Colaba, where they were to be stationed, in the following June. In June, 1800, he submitted his first annual report to the Medical Board at Bombay. This begins with some remarks on the barracks, in which he points out their deficiencies, and that instead of having been built on the central ridge of the island, exposed to all winds, they had been placed in the worst site. The report takes each month in turn and comments on the climatology and prevailing diseases and their apparent causes. In July there were 129 cases of dysentery alone, and 20 per cent. of the regiment was in hospital, while hepatitis appeared in August.

"Cases beginning as dysentery often ended as hepatitis, and, if not the same disease, the two are most closely allied in this

climate." Taking the two together, there were 544 cases with 40 deaths during the year, the strength being a little over 500. Of the 40 deaths, 22 were examined *post mortem*, "and in 16 of these we found the liver diseased. So large a proportion as 16 out of 22 cases of dysentery and hepatitis taken together, having on dissection evident marks of diseased liver, the natural conclusion is that dysentery is almost always connected with a disease of the liver as a cause; that the diseases are, however, sometimes distinct and separate, we have satisfactory proof of, even from dissection." "When the symptoms indicated a suppurative state of the liver, I have never seen any medicine serviceable." The report ends as follows: "A loss of  $\frac{1}{4}$  in the first year in this climate of a regiment we learn is as small a proportion as most newly arrived European corps have suffered in the same period, yet this proportion of deaths is very considerable, and if continued would in a short period exhaust a corps. In a political and economical view this waste of men is alarming, and were we to calculate what a loss of forty-three European soldiers cost, it would be highly worthy of the attention of the Honorable Company to take measures to lessen this waste of men, and that the gentlemen who direct the medical affairs in this country could suggest these measures there can be no doubt. Though to newcomers sickness is in a great many cases unavoidable, yet perhaps in as great a number of cases the cause of sickness might be, if not obviated, often lessened. Our loss has not been entirely confined to men. Of thirty-five women who landed with the regiment in India, five have died in the year, and of nineteen children thirteen have died during the same period, and all of them under 5 years of age."

During the following year the regiment was in Ceylon and Egypt after leaving Bombay. On December 5th, "with the exception of one, every man in the regiment appeared on the parade, and this was the case of consumption already alluded to. I met him on his way from the hospital to the parade, and I had some difficulty to prevail with him to return to the hospital." "For the last two years in the hot months the men were daily marched one mile to the fort of Bombay, were much exposed to the sun on duty, and in the heat of the next day were marched back to Colaba, yet it appears by the table of both years that the hot months were the most healthy. If heat is noxious, something in this instance obviated its effects. Was this exercise? One instance in point, though not within the date presented, will illustrate this. In June and July, 1801, the degree of heat on a march of 130 miles over

the sandy desert of Thebes on the banks of the Nile in Upper Egypt was extreme. I have seen the thermometer in a soldier's tent at 118. The soldiers had at the same time to combat severe duty, for want of native followers, much duty of fatigue and the effects of the pernicious drying wind peculiar to the country, yet under all these circumstances the state of health of the troops was equal to what it had been at any period in India. Heat of itself does not appear to be a principal cause of the prevailing diseases."

"On looking over the returns and noticing the proportional sickness of different periods a periodical increase was very striking. The eight or ten days that followed the payment of the balance due to the men regularly produced much sickness. The soldier's pay in India is very liberal; the established allowance of provision is as much as he can use. Perhaps the allowance of arrack is too great in the rainy season; it is [two or three illegible words] daily, but the price of arrack is low, and too often the soldiers get toddy. Some degree of intoxication and irregularity is perhaps unavoidable; intemperance has hitherto always appeared as a principal cause of the diseases that have prevailed. Subsequently on the march over the desert, and while sailing on the Nile, there were no spirits issued in July and August, 1801, yet the Army in general was uncommonly healthy." It will perhaps be remembered that forty years after this was written total abstinents were refused by life assurance offices, and so had to form an office of their own.

"Though, perhaps, the remaining a certain length of time or a naturalization to the climate was necessary, yet one reason may with much probability be brought forward to account for the difference in point of health between native and European corps. A native of India is astonished at first to see the meals of animal food and the quantity of spirits devoured by Europeans. There can be little doubt that the nearer approach to the mode of living of the native the more nearly we shall attain to their state of health.

"Of nearly 100 cases of fever which occurred the greater part was trifling, originating from inebriety or exposure to the sun; this required only rest, and perhaps a purgative, and recovered in two or three days. The fever which appears in October and November was remittent. In two cases . . . there was at first a great deal of reaction, succeeded by extreme debility. These two approached the nearest to typhus" (this and typhoid were not differentiated for thirty years to come) "of any cases that I have ever seen since my arrival in India; the ablution with cold water seemed on these, and only on these, two cases to succeed, though it was tried on several of the other cases."



“The irreparable injury done to the constitution by repeated courses of mercury at length becomes in that climate a disease of itself; too frequently have we seen the constitution thus broken and, if he had the means, a return to Europe rendered necessary for the patient. Too often the practitioner is more to blame than the remedy; sometimes the indiscriminate, sometimes the injudicious use of the mineral proves as hurtful as the original disease.” Sir James also wrote a lengthy paper on the value of nitric acid both externally and internally in syphilis, which, when the way in which mercury was then abused be considered, when all venereal conditions, based on Hunter's inoculation of himself, were thought to be due to a common cause, and were treated by mercury to the point of salivation, was probably not without much value. Unlike many enthusiasts, however, he was not blinded to the virtues of all drugs but his own, for he says that in some cases where the acid fails mercury succeeds.

From a *post-mortem* report of August 11th, 1800: “Cæcum . . . Vermiform process enlarged, distended, and mortified to within an inch of its extremity; full of a thick purulent matter; at its origin from the pouch much inflamed.”

When it is considered that at the period in question the clinical thermometer, the microscope, and even the stethoscope were unknown, it will be agreed that Sir James gathered a rich harvest as the fruit of less than two years in the East, and that even after the lapse of a century his words are by no means without profit for us.

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## MALTA FEVER IN SOUTH AFRICA.

By P. D. STRACHAN, M.A., M.B., Ch.B.,  
*Philippolis, Orange River Colony.*

AND

LIEUTENANT-COLONEL C. BIRT,  
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PAPER BY DR. STRACHAN.

THE following introduction to Lieutenant-Colonel Birt's paper on Mediterranean fever in South Africa is intended to serve as a brief summary of the advances made by the writer in the study of this disease since September, 1906, and as a supplement to a paper on "Undulant Fever in South Africa," published in the *South African Medical Record* of December 10th, 1906, and reprinted in the *JOURNAL OF THE ROYAL ARMY MEDICAL CORPS*, July, 1907. In that paper all the aspects of the subject which seemed important were treated more or less fully, according to the amount of material at the writer's disposal. Here only those aspects will be considered in which subsequent experience has rendered modifications necessary or additions possible. The bacteriological section, in which the greatest progress has been made, will be left almost entirely to Lieutenant-Colonel Birt, to whose efforts this progress is mainly due.

## SYMPTOMATOLOGY AND SEMEIOLOGY.

In September, 1906, an analysis of 138 cases of the disease was made with a view to finding the case percentages of the various symptoms, complications, and sequelæ. It was found that these, with few exceptions, agreed very closely with the statistics of Hughes. The number of cases that have come under observation in this district since September, 1906, is 99, in all of which the serum test was applied. Little or no change would be made in the statistics by incorporating these later cases in them. There is reason to believe that the percentage of ambulatory or almost symptomless cases recorded ought to be higher; for in the summer season, 1907 to 1908, a severe epidemic broke out in the town of Philippolis for the first time, and many ambulatory cases came under observation. It is safe to say that at the outlying farms a large proportion of the ambulatory cases are not seen by medical men.

Hughes says that sexual potency is not diminished during the

course of the disease, and that pregnancy is not interrupted. The writer knows of one case in which a healthy child was begotten by a male during a severe and protracted attack of Mediterranean fever. This gentleman lost 80 lb. in weight in six months. Needless to say he could afford the loss. On the other hand, abortion occurred in two cases during the course of the disease, and in another during convalescence. In six other cases, four white and two negro, the patients were found to be suffering from Mediterranean fever immediately or shortly after parturition. The babies apparently did not suffer from the disease. The sera of two of the babies, one white and one negro, were tested by Major J. E. McNaught and found to contain the specific agglutinins. Milk from the mothers of these two contained the specific agglutinins, but *Micrococcus melitensis* was not recovered, contaminations being present. Where Mediterranean fever complicates the puerperal state grave apprehensions of septicæmia, or pelvic suppuration are apt to arise, unless the correct diagnosis is made. Often this can be done with certainty only by means of the agglutination test, or by cultural experiments.

Several cases of Mediterranean fever occurring in children only 2 years old were noted. In such young subjects the early stage of hip-joint disease is apt to be simulated.

Among the ninety-nine cases here recorded the mortality was three. One married woman, aged 36, and another, aged 63, died of broncho-pneumonia. A man, aged 49, died during apparent convalescence after a chronic attack lasting eight months. He suddenly began to suffer from shortness of breath, which he attributed to a fright. The breathing continued to be abnormally rapid (40 to 60 per minute) for eight days without pyrexia or physical signs of disease in the lungs. On the eighth day the temperature went up to  $103^{\circ}$ , and fine crepitations were audible at the bases of both lungs. He died cyanosed at 4 a.m. on the ninth day. This condition was perhaps due to some irritation of the respiratory centre. Bromides and iodides were given without effect. Chloral hydrate might have proved more useful.

*Epidemiology.*—As has been stated above, during the season 1907-08 there was a severe epidemic of the disease in the town. The cases in the western half of the district, where the disease was first observed, were fewer than usual, while there was an increase in the number in the eastern half. There were abundant opportunities for working out the epidemiology of the disease, but unfortunately the severity of the epidemic, and the exigencies of

private practice consequent thereon, left little time for epidemiological work, or even for a proper clinical study of the disease. The work which was undertaken, over and above that inseparably connected with the duties of a medical practitioner, was therefore meagre in the extreme.

In October, 1907, at a small holding on the commonage, about a mile to the north of the town, two members of a family, S—, were found to be infected. This family had a numerous herd of goats. They drank the milk themselves and also sold it in the town. Subsequently two other members of this family became infected. In the town fresh cases continued to appear from October, 1907, to March, 1908, a period which coincides fairly closely with the usual seasonal distribution of the disease here. Most of the infections in town could be traced to milk supplied by the S. family. A few were traceable to goat's milk from other sources, and a few could not be traced to goat's milk at all. In one family, B—, the father, the mother, and two sons, in fact the whole household, became infected. They drank no goat's milk, and kept no goats on the premises, but they had two milch cows kept by the S. family, and milked in a kraal adjoining the goat kraal. It was not until April, 1908, that the writer examined one of these cows, the other having disappeared, and nine of S.'s goats. The cow's serum gave a positive reaction almost complete in 1—10, Major McNaught found it complete in 1—10 and well marked in 1—20. Of the goats, two Angoras and one hairy goat (called Boer-bok) gave positive reactions in 1—10. In another family in town one member only, a girl, aged 19, became infected. They owned no goats and bought no goat's milk. They used the milk of one cow kept on the premises. This cow's serum gave a negative reaction.

In the natives' location three members of one family, J—, his wife, and his child were found to be suffering from Mediterranean fever. They kept one milch goat. This goat's serum was found to react in high dilutions. The writer using dead cultures, obtained a well-marked reaction at 1—40; but Major McNaught and Major Statham got as high as 1—200 with living cultures. After a delay of nearly three months, over which the writer had no control, Major Statham received the goat alive at Pretoria. He failed to get cultures of *M. melitensis* from the blood and milk, but on slaughtering the animal, he got a culture from the spleen.

S., J.'s brother, had two goats kept in the same enclosure as J.'s. The writer found the serum of these negative. Major

McNaught found one positive in low dilutions. S.'s wife became infected in November, 1907.

In December, 1907, Dr. D. M. Macrae found a native youth in the location infected. This youth suffered from aphasia for a month just before convalescence. His father kept ten milch goats. The sera of all these were examined by the writer. Four were found to give complete clumping of *M. melitensis* in dilutions of from 1—10 to 1—40.

Dr. E. W. Robertson, of Cape Town, and Major McNaught, using living cultures, got six positive reactions, three doubtful, and only one absolutely negative out of the ten. The goat giving the strongest reaction was sent alive to Dr. Robertson at the Cape Government Laboratory in January, 1908. At the time of writing no report on this goat had been received from Dr. Robertson. Lieutenant-Colonel Birt, however, got a culture of *M. melitensis* from a small blood sample from the same animal. The writer asked Dr. Robertson to publish his own results, which may appear at a later date, if anything positive has been achieved.

From the researches of the Malta Fever Commission, and the striking result of preventive measures carried out at Malta, it would appear that, so far as man is concerned, the swallowing of infected milk is practically the only mode of infection. Experiments on monkeys with naturally infected dust were negative. How do goats and cows become infected? If man can be infected naturally by inhaling or swallowing dust, such a mode of infection must be more common among a pastoral people than among troops or seamen.

The seasonal distribution here is easily explained. The kidding season begins at the end of July. By September all the female goats are in full milk. By December they begin to dry up, but those milked by hand can be kept in milk many months longer. In the winter months the animals are pregnant and dry.

Here the same incredulity prevails which is found among the civil population at Malta. The posting up of warning notices had no effect. The writer received the whole credit of the fantastic notion that the goat, "een van de gezondste van dieren" (one of the healthiest of animals), "could cause slepende koorts." Were not its excrements used as medicine and its bowels as poultices with the best results. Compare such remarks with Colonel Bruce's dramatic paper, "The Extinction of Malta Fever." The class incidence of the disease here is the reverse of what it used to be in the garrison of Malta. Social distinctions, if they exist here at

all, are a matter of riches and poverty. Among the Boers the spoken and unwritten language of rich and poor is the same, and where elevations are impossible there can be no depressions. Malta fever is pre-eminently the poor man's disease, as the goat is his stock. Natives and poor whites appear to be equally liable, the rich seldom contract the disease.

*Geographical Distribution.*—Mediterranean fever has been proved by clinical evidence and the agglutination test to be present in the following places in addition to those enumerated in 1906: Hanover, Beaufort West, and Steytlerville (Cape Colony), Gaborones (Bechuanaland). The medical men who have diagnosed the disease and proved its existence in these places are the following in order: Drs. Broadhurst, Bensby, A. Garrow, and D. M. Macrae. In the report by the Medical Officer of Health for Cape Colony, Dr. Gregory, on the Public Health for the year 1906, are included summaries of the District Surgeon's Annual Reports. From these it appears that Mediterranean or undulant fever occurs in many parts of Cape Colony, including Kimberley. Dr. William W. Stoney, District Surgeon of Kimberley, states that undulant fever undoubtedly exists in Kimberley, and has been recognised as such for many years. He has confirmed his diagnosis by the agglutination test in various cases since 1900.

*Treatment.*—On treatment the less said the better. Perhaps therapeutics is the least exact of all the inexact sciences on which medicine is based. Certainly the therapeutics of general practice in a South African country district are anything but exact. Patients are seen at such irregular intervals that no scientific inductions can be made.

In 1906 to 1907 injections of *M. melitensis* vaccine were tried on several cases, from 500 to 1,000 million dead germs being injected into different sites at intervals of a week. Three chronic cases recovered rapidly. On the acute or early stage cases no effect was observed. In 1907 to 1908 a paper by Fleet-Surgeon McNabb on the use of cyllin in Mediterranean fever came under the writer's notice. This substance is manufactured by the Jeyes' Sanitary Compounds Company, and put up in 3-minim capsules for stomach or intestinal use. Presumably, the intestinal capsules are not soluble in the stomach. Cyllin is said to be an almost non-toxic, powerful antiseptic, the whole of which is recoverable from the fæces. It is difficult to explain the beneficial action in Mediterranean fever of an intestinal antiseptic which is not absorbed into the blood-stream, unless it be on the ground that physiological

antiseptics, which are naturally used up in fighting the intestinal flora, are set free to be absorbed into the blood-stream and there to fight the *M. melitensis*; or on the assumption that the products of the intestinal flora hinder in some way the production of antibodies.

The writer used cyllin intestinal capsules (or palatinoids as they are called by their makers) in doses of from three to six daily on a large number of cases: very irregularly, it must be confessed. If a chronic case be defined as one which lasts more than four months, then there were four chronic cases during the season 1907 to 1908. Of these, three refused the capsules after taking a few, on account of a burning sensation which they produced. The fourth lived at a distance and did not report himself or apply for more medicine after he had taken two dozen. One man, who misunderstood the directions, took a bottle of one hundred at the rate of twelve daily. He felt so well at the end of a week that he thought he was cured; but he had a severe relapse some weeks later.

Three children in one family, aged 9, 10, and 11, were kept in bed and treated continuously with cyllin at the rate of three at first and later six daily. All three had a typically undulant acute pyrexia, the temperature often going above 104°. There were no other signs except slight wasting in two and extreme wasting in the third. Their tongues were perfectly clean, red and moist, and their spleens were slightly enlarged. The serum of all three reacted in high dilutions, and from the blood of one Lieutenant-Colonel Birt grew a culture of *M. melitensis*. The duration of the pyrexia was twenty-six, forty-four, and forty-one days respectively, from the beginning of the treatment. The numbers of waves were respectively 2, 3½, and 4. In all three the pyrexia terminated rather suddenly with a subnormal morning temperature for a week or more.

On February 11, 1908, a young lady at a distant farm was found to have acute pyrexia with pain in the left iliac fossa. Here a somewhat large fluctuant tumour was made out. Her serum was found to agglutinate the *M. melitensis* in a dilution of 100. In a few days the tumour was found to be enlarging rapidly. On February 21 the patient was operated upon by Dr. Flockemann, of Bloemfontein, assisted by the writer, Dr. Ross, of Fauresmith, acting as anæsthetist. Both ovaries were found to be cystic, and had to be removed. The patient remained in hospital for a month, during which the cyllin treatment was given. The temperature curve was complicated by the presence of a deep-seated stitch

abscess. After this was healed there was no pyrexia, and the patient returned to the farm cured. On the day on which she left a sample of her blood was taken. Lieutenant-Colonel Birt found a marked falling off in the agglutinins. Nevertheless, there was no relapse. Indeed, the lady contemplates matrimony at an early date.

It may be mentioned that the large ovarian cyst was full of dark altered blood. Perhaps it acted as a reservoir of agglutinins.

In no case was a rapid specific effect observed to follow treatment with cyllin. All that can be said is that the duration of the pyrexia appeared to be shortened.

Aspirin in doses of 5 to 10 grains was found very useful in combating the neuralgic pains, the only objection to its use being its powerful antipyretic and diaphoretic effects when given during pyrexia.

In conclusion, the writer has to express his thanks to his partner, Dr. D. M. Macrae, who supplied him with notes on his cases, to Major Statham, Major McNaught, and Dr. E. W. Robertson, who did some of the bacteriological work, and lastly, to Lieutenant-Colonel Birt, whose contribution follows.

#### PAPER BY LIEUTENANT-COLONEL BIRT, R.A.M.C.

To Dr. P. D. Strachan will remain the credit of being the pioneer in the differentiation of the fevers of South Africa. He has been the first to make a serious study of Malta Fever as it exists there. His clinical acumen pointed out its probable prevalence and he was quick in taking bacteriological measures to confirm his suspicions. He has resolved what was an ill-defined nebular into a sharply cut image. His paper, to which the foregoing is a sequel, was reproduced in the JOURNAL OF THE ROYAL ARMY MEDICAL CORPS of July, 1907, vol. ix., p. 83. It is of abiding merit.

His partner, Dr. D. M. Macrae, also has given an excellent description of the fever drawn from his own observations (*South African Medical Record*, February 25, 1908). He lays stress on the frequency of the ambulatory type. The clean tongue, or one coated with thin silvery fur, he recognised as an important guide to diagnosis. Pulmonary congestion, in some cases with intense intercostal pain, may suggest pneumonia; in others he has seen appendicitis simulated. He remarks that rheumatism, either acute or chronic, is a rare ailment in the Orange River Colony, hence articular pains are indicative of Malta fever. In infants an erroneous diagnosis of hip-joint disease may be made.



Dr. Strachan has been unwearied in supplying material for research. He has sent between 200 and 300 specimens of blood, pus, serum, milk, &c., most of which he himself has tested. Our results throughout have been almost invariably concordant. As 63 per cent. of the samples have arrived in London free from contamination, Dr. Strachan's method of collection is instructive.

While making the glass capsules for the reception of the blood, he has sealed the ends, which he has broken off with sterile instruments at the moments of using. After washing the lobe of the ear with alcohol, and drying with sterile absorbent cotton-wool, he has withdrawn  $\frac{1}{50}$  to  $\frac{1}{10}$  cc. of blood from a puncture produced by a needle or the broken end of the glass capsule. On arrival in London the blood capsules have been opened with the usual precautions, the clot has been removed and placed on a glucose-nutrose-agar slope. A fivefold dilution of the serum in physiological salt solution has then been made. One part of this has been mixed with one of salt solution, and so on, till a series of dilutions,  $\frac{1}{5}$ ,  $\frac{1}{10}$ ,  $\frac{1}{20}$ ,  $\frac{1}{40}$ ,  $\frac{1}{80}$ ,  $\frac{1}{160}$ ,  $\frac{1}{320}$ ,  $\frac{1}{640}$ ,  $\frac{1}{1280}$ , &c., has been obtained. Hence, if one part of each of these be mixed with an equal volume of the emulsion of *M. melitensis* the amount of serum will have been reduced to  $\frac{1}{10}$ ,  $\frac{1}{20}$ ,  $\frac{1}{40}$ ,  $\frac{1}{80}$ ,  $\frac{1}{160}$ ,  $\frac{1}{320}$ ,  $\frac{1}{640}$ ,  $\frac{1}{1280}$ ,  $\frac{1}{2560}$ , &c. These have been drawn into glass tubes of about 1 mm. calibre, or, for the sake of convenience, have been sucked into one long pipette with the aid of an india-rubber teat, beginning with the highest dilution, with an air-bubble to separate it from the next, and so on. The results have been recorded at the end of twenty-four hours. There is, however, little change in the sedimentation after this interval. In the higher dilutions in which no clumping has occurred there is still even turbidity for a week or more.

To prepare the *M. melitensis* emulsions, recently isolated strains, mostly South African, have been grown on agar containing 1 per cent. each of peptone, glucose, and nutrose. The reaction has been such that 25 cc. of normal alkali solution have been required to produce neutrality to phenol-phthalein in 1,000 cc. of the agar. The length of incubation is immaterial; cultures of a fortnight or month give good emulsions. Physiological salt solution has been introduced into the tubes, and the micrococci have been removed from the agar and incorporated with the fluid by means of a glass filament. The *M. melitensis* is remarkable in making evenly turbid suspensions. This ability to emulsify so readily is of diagnostic importance, as has been noted by Horrocks. Sterilisation has been effected by heating to 55° to 60° C. for half

an hour, after which 0·5 per cent. phenol has been added. Formalin is unsuitable as a preservative. Emulsions containing it become unreliable. The carbolised preparation has been proved to retain its properties unimpaired for two years. On every occasion before use the suspension has been tested with normal or non-specific serum, in a  $\frac{1}{20}$  dilution of which no agglutination has been observed, and none, or traces only, in a  $\frac{1}{10}$ . A reaction, then, in a  $\frac{1}{20}$  dilution of a serum is diagnostic of Malta fever, past or present. After long subculture, some strains of *M. melitensis* become agglutinable in saline fluid, or when not so clumped they may react to a mere trace of serum from any source. The necessity of controls with normal blood is apparent. Manipulations with the living microbe are fraught with danger. A large proportion of workers with it have been infected. But apart from the safety and convenience of using sterilised cultures there is another great advantage. Anomalous reactions are suppressed. If living suspensions are employed, it sometimes happens that a specific serum reacts when highly diluted, but may cause no agglutination if more concentrated. In an experience of between 2,000 and 3,000 agglutination tests with dead emulsions, no instance of such an inhibited reaction has come under my notice. The density of the emulsion has been measured by mixing it with an equal volume of water, and drawing it into a glass tube 1 mm. in internal diameter. The opacity should be well marked. This corresponds to about 50,000 million micrococci per cubic centimetre. Since several cubic centimetres of the suspension were prepared at one operation, the estimations of the agglutination were comparable with one another. The ratio of the number of bacteria to the volume of the emulsion is a factor in determining the clumping index of the blood. The simplicity of the sedimentation method with killed cultures, which involves no more apparatus than a few glass tubes and a small amount of a preparation which retains its activity for years, brings the diagnosis of Malta fever within the range of every practitioner.

The agglutinative value of the blood of 146 individuals in the course of the infection has been estimated quantitatively by means of successive dilutions until the limit was determined. In 59 to 40 per cent. this was  $\frac{1}{20}$  to  $\frac{1}{100}$ ; in 66 or 45 per cent. it was  $\frac{1}{100}$  to  $\frac{1}{1000}$ ; in 21 or 15 per cent. it was  $\frac{1}{1000}$  to  $\frac{1}{12000}$ . The serum of 29 convalescents for two to eighteen months after Malta fever was tested. Twenty of these agglutinated the *M. melitensis* in dilutions of  $\frac{1}{20}$  to  $\frac{1}{100}$ , and nine in dilutions of  $\frac{1}{100}$  to  $\frac{1}{1000}$ . The clumping power of people in health or suffering from any ailment except

Malta fever has been *nil* in  $\frac{1}{80}$  dilution. The transit of the blood capsules from Philippolis to London has occupied about three weeks. The agglutinins may undergo some diminution in this interval, but the loss is not great. A serum six weeks old clumped the *M. melitensis* when diluted to  $\frac{1}{25600}$ . Eight weeks later its value was reduced below  $\frac{1}{80}$ . Two years afterwards it was still active,  $\frac{1}{40}$ . In thirteen samples of blood, the highest agglutinative value of which was determined by Strachan to be  $\frac{1}{80}$ ; three to six weeks subsequently it was found to be the same in four, to have become reduced to  $\frac{1}{80}$  in three, to  $\frac{1}{40}$  in three, and to  $\frac{1}{20}$  in three. In one, the original strength of which was  $\frac{1}{80}$ , it remained the same. In another it had been lowered from  $\frac{1}{80}$  to  $\frac{1}{40}$ . All the above proved free from contamination on culture. The presence of other bacteria has little effect in impairing the agglutinative power of the blood. Thus a serum, the value of which Strachan determined as  $\frac{1}{80}$ , reacted in London  $\frac{1}{80}$ , though contaminated. Another, of  $\frac{1}{40}$ , was reduced to  $\frac{1}{80}$ . One of the value of  $\frac{1}{80}$  was found to be  $\frac{1}{40}$ . Of six with an index of  $\frac{1}{80}$ , three reacted  $\frac{1}{80}$ , one  $\frac{1}{40}$ , and one  $\frac{1}{20}$ . Of seven with an original power of  $\frac{1}{80}$  or  $\frac{1}{60}$ , six showed no reduction of the agglutinins, and in one the value was  $\frac{1}{20}$ . From all of the above, bacteria in great variety were grown. Moreover, a sterile specific serum has been inoculated with a staphylococcus. Its clumping power has not been diminished by the micro-organism. Blood in the dry state preserves its specific property for long. On the other hand, blood diluted with physiological saline fluid loses its agglutinins in a few days. A serum gave a complete reaction,  $\frac{1}{80}$ ; the fivefold dilution of it was preserved till the following day, when it was again tested; no trace of agglutination was observed now in  $\frac{1}{80}$ . From this it follows that an accurate diagnosis of Malta fever may result from the crudest methods of blood collection. A drop of blood squeezed from a pinprick of an uncleaned finger and dried on any fragment of paper will give infallible evidence of the infection.

Nevertheless, from a scientific standpoint it is desirable to isolate and identify the invading micro-organism. With this object in view, Dr. Strachan has withdrawn the blood under aseptic precautions and has attained sterility in 63 per cent. of his cases, as was mentioned above. Accordingly, it has been possible to obtain cultures of the *M. melitensis* from  $\frac{1}{80}$  to  $\frac{1}{10}$  cc. of the blood of thirty-three of the febrile cases, that is, in 22 per cent. In all except three instances it has been the only micro-organism present. The more rapid growth of contaminating bacteria suppresses the development

of *M. melitensis* in the great majority of cases. These extraneous organisms have been *staphylococci*, *M. tetragenus*, *Bacillus coli communis*, *proteus*, *subtilis*, *mycoides*, *prodigiosus*, *torulæ*, and moulds, which have appeared on the surface of the agar twenty-four hours after inoculation. Now the appearance of the colonies of *M. melitensis* on the agar slope may be long delayed. This is shown on the following table:—

Period of incubation at 37° C. required before <i>M. melitensis</i> was visible, in days	2	3	4	5	6	7	8	14	17	20	34	41	days
Number of blood samples which gave growths of <i>M. melitensis</i>	3	6	7	7	1	2	2	1	1	1	1	1	

Hence, though colonies of the *M. melitensis* appeared usually within a week of inoculation, yet it was not exceptional for a much longer interval to elapse, doubtless due to the coccus being buried in the centre of the clot of blood implanted on the agar slope. One of the cases from the blood of which the *M. melitensis* was recovered was complicated with enteric fever. The agglutinative index to the *M. melitensis* determined by both Dr. Strachan and myself was  $\frac{1}{10}$ . In another instance the patient had been ill for a long period, and the blood gave a trace of agglutination only in  $\frac{1}{10}$  dilution, though the *M. melitensis* was present. Therefore, although a positive clumping reaction predicates the existence of the infection, yet the absence of agglutinins does not necessarily warrant us to exclude Malta fever. Such cases are unusual. Three only have come before my notice. The failure of the blood to react to the invading micro-organism is a sign of evil omen. The agglutinative power of the other specimens of blood which contained the *M. melitensis* was  $\frac{1}{20}$  in two,  $\frac{1}{40}$  in four,  $\frac{1}{80}$  in eight,  $\frac{1}{160}$  in two,  $\frac{1}{320}$  in eight,  $\frac{1}{640}$  in three,  $\frac{1}{1280}$  in one,  $\frac{1}{2560}$  in two,  $\frac{1}{5120}$  in one.

It may seem remarkable that many of these bloods should have retained their high clumping index. Three or four weeks intervened before cultures were made. In this space of time it might have been supposed that the agglutinins would have been absorbed by the living *M. melitensis*. That this micrococcus was present in no small numbers was proved by the profuse growth obtained in many, including those which had an index of  $\frac{1}{2000}$ . In the specimen with the titre of  $\frac{1}{4000}$ , however, the agar tube was incubated forty-one days before growth was observed. It was limited to one colony only. The cultures were identified as being the *M. melitensis* by the late appearance of the colonies on the glucose-nutrose agar, by their characters and tendency to become brown with age, by the production of alkalinity in milk, by their readiness to form

evenly turbid and permanent emulsions, which were agglutinated by the blood from which they were isolated by other specific serums and by no other; microscopically, by their form of a minute oval coccus or cocco-bacillus, not very receptive of stains which were quickly discharged from the coccus by alcohol, and by their inability to retain the dye under Gram's method. No difficulty has been experienced in the identification, since no other microbe has been encountered which has borne any resemblance to the *M. melitensis*. If the characters of all pathogenic bacteria were as sharply defined as those of the *M. melitensis*, the work of the bacteriologist would be considerably lightened. The South African strains of the *M. melitensis* were usually more sensitive to the agglutinins in the blood of South African cases than to those in the blood of Mediterranean patients. Thus a Philippolis serum clumped a Philippolis culture completely in  $\frac{1}{400}$ , but produced traces of a reaction only in that dilution when tested with an emulsion of the organism isolated from a man who had been infected in Malta. A Mediterranean serum gave an index of  $\frac{1}{8000}$  with a Mediterranean strain, but only one of  $\frac{1}{1000}$  with a South African culture. The identity of the growths was also confirmed by means of Castellani's test. The agglutinins of a serum could be absorbed by treating it with an emulsion of *M. melitensis* from either source. Agar slopes freed from the culture of the one failed to afford a suitable medium for the other.

There can be but little doubt that the germ has been introduced into South Africa through the medium of goats infected in the Mediterranean area, so the similarity of the clinical features of the European and African fevers, and of the characters of the respective infecting agents, causes no surprise. The blood of eleven goats has clumped the *M. melitensis* in dilutions of  $\frac{1}{10}$  to  $\frac{1}{80}$ . That of normal goats has given negative results in  $\frac{1}{10}$ . From one of the former the specific germ has been isolated. The milk of three goats has contained agglutinins.

Dr. Strachan, in his former paper, traced three epidemics in small communities to the use of milk of infected goats. He now reports three more instances. Four members of the household of a farmer who supplied milk to Philippolis were attacked. The *M. melitensis* was recovered from the blood of one. Three of his goats were infected. A widespread outbreak in the town was the consequence. He relates also how the whole of another establishment, including the father, mother, baby, and goat, was stricken with the fever. In the third example of dissemination of the germ

through the agency of goats four of the flock reacted to the specific test. More recently he has sent the blood of a father and son, and the blood and milk of one of their goats. Agglutinins were found in all the specimens, and the *M. melitensis* was grown from the son's blood. That the goat is the predominant factor in the spread of Malta fever in South Africa must now be accepted as proved. Dr. Strachan, nevertheless, has studied the part played by other agencies. He adduces evidence that some of the cows may propagate the disease through their milk. A capsule of blood which reacted in  $\frac{1}{10}$  dilution was sent by him. The serum of a normal animal in this dilution causes no agglutination. The foregoing observations may be thus summarised:—

(1) Examination of the blood of 177 persons resident in South Africa has shown that they have been infected with the *M. melitensis*.

(2) The *M. melitensis* has been isolated from  $\frac{1}{80}$  to  $\frac{1}{10}$  cc. of blood preserved in glass capsules for three to six weeks in thirty-three cases.

(3) Emulsions of the *M. melitensis* sterilised at 55° C. with the subsequent addition of 0·5 per cent. phenol mixed with the diluted blood serum, and drawn into glass tubes of 1 mm. in diameter, afford a sure and ready method of the diagnosis of Malta fever. This plan can be adopted by any practitioner, though unprovided with laboratory facilities.

(4) Specific blood retains its agglutinating property for weeks or months, even when contaminated.

(5) There is a widespread epizootic of Malta fever among the goats of South Africa. Their milk conveys the infection to man.

## Editorial.

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THE Journal Committee having decided to publish from time to time short memoirs, accompanied by photographs, of officers who have rendered distinguished service in the cause of military administration, sanitation, medicine, or surgery, we commence the series with an account of the services of Sir James McGrigor, who may justly be called the first Director-General of the Army Medical Department; for, although his immediate predecessor was styled Director-General, he was merely the senior officer of the Medical Board, then consisting of three members. Shortly after Sir James McGrigor's accession to office the members of the Board were reduced to two, and the entire management of the Medical Department of the Army eventually passed into his hands.

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### MEMORIAL STATUE OF SIR JAMES McGRIGOR, Bt., M.D., K.C.B., K.C.T.S., F.R.S.

In the first week of July the statue was removed from the grounds of Chelsea Hospital and re-erected at the Royal Army Medical College, in the small quadrangle between the officers' mess and the Commandant's quarters.

We are able to give the names of the subscribers to the statue, Sir James McGrigor having kindly presented the roll to the Royal Army Medical College.

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## United Services Medical Society.

### THE MOUTH, NOSE, THROAT AND EAR, FROM THE RECRUITING POINT OF VIEW.

BY CAPTAIN E. B. WAGGETT.

*Royal Army Medical Corps (T.F.).*

I AM conscious of a great privilege in being invited as a member of the Territorial Force to read a paper before this Society. It was my wish to do honour to the occasion by writing upon a subject of which I had some competent knowledge, but on reflection I decided to introduce for discussion a topic which involves questions the answers to which present a good deal of difficulty to the mind of a surgeon who is not by profession a soldier. Frankly, I know nothing at all, at first hand, of the behaviour of my special organs—the nose, throat, mouth, and ear—on active service, and not very much of the problems they set to the medical officer, either in his general barrack work or on recruiting duty. On the other hand, I have many years' experience of young men of enlisting age as they come to us in the hospital out-patient room. I am constantly thinking of them from the military point of view, and I believe I shall be one of a great many Territorial Medical Officers who will be deeply grateful to officers present to-night who will give us the fruits of their experience and furnish us with some rules which will guide us in our recruiting work.

It is, of course, clear that in selecting men for crack regiments, or for active arduous service abroad, a very high standard must be adopted with regard to these important organs; but we cannot but realise that if the present Territorial Force is to be recruited to full strength, and, more particularly, if some system of universal service is happily organised, the standard must be modified.

It has been my painful duty recently, in examining recruits for a Territorial battalion, to reject some 15 per cent. of candidates full of patriotic good-will and desire for disciplined training. I am anxious to learn from you, gentlemen, what you consider to be the maximum departure from the normal which can safely be passed as "fit" for military service, and particularly for defensive service in the British Isles.

I will at once disclose the degree of my ignorance and put an example of what I mean, by referring to the teeth—a matter of

which I have only a partial knowledge even in civil practice. With regard to the minimum number of teeth, I understand that no actual standard is laid down for the Territorial recruit, and that the medical officer is instructed to reject where the dentition is insufficient for proper mastication. I am for the moment considering a mouth where all carious teeth have been removed. It is exceedingly common to see healthy and fairly well-grown young men in whom the molar dentition is exceedingly defective; possibly, on one side, no molar bite at all; on the other, one or more large gaps. Among our city-bred boys, especially, it is almost exceptional to find a good molar bite on both sides, thanks to the inequality in development of the upper and lower jaws respectively. I have asked medical officers of South African experience what we ought to do with these youths. They have always replied, "For goodness sake send us out no more men with defective teeth; one of our chief troubles out there was to extract decayed teeth and send the men back to England. They are only a burden to us, for they cannot bite the Army biscuit."

This answer has, I confess, seemed to me to be very unreasonable, and to smack too much of hidebound conservatism. Much energy has been given by instructors in the training of these men, and a good deal of money has been expended in transport and equipment for no purpose—the men have been sent back "unfit" because they cannot grapple with the Army biscuit.

The civilian mind cannot restrain the question, Was the biscuit made for man, or man for the biscuit? Surely it cannot be difficult to devise a biscuit suitable for marching rations which is also easy of mastication. One can understand that under certain circumstances—the selection, for instance, of a small column of men for an expedition in mountain districts—the hard biscuit may fairly be made one of the touchstones of fitness; but from what I personally know of the poorer class of Londoners, I am sure that that test cannot be applied, if anything approaching universal service is contemplated. I venture to submit that a man who in civil life has kept himself well nourished with the aid of a modicum of teeth should, at all events for Home Service—be passed as "fit," and that the regulation ration should be made suitable to all comers. This question applies, of course, not to biscuits only, but there should in these days of wheeled kitchens be no difficulty in making the ration fit the man; and I believe that some accommodation of this kind will have to be made if every man of passable physique is expected to defend his country. The criterion of



dental fitness which I would suggest would be found not in the mouth but in the general nutrition of the man; assuming, of course, that he belonged to that class of life which does not depend upon a refined and delicate *cuisine* for its daily food.

With regard to artificial dentures it will be exceedingly interesting to some of us to learn what is their actual value in military life. My experience of them in hospital practice is not very favourable, for the cheaper variety are often ill-fitting, and certainly I believe that few examples would stand the test of active service under present conditions. They seem to me to be chiefly valuable where the patient is both edentulous and a fool, for such persons are in the habit of bolting large lumps of meat without any attempt at mastication—a habit which not infrequently induces symptoms of œsophageal stricture, as well, of course, as putrefactive phenomena in the gastric contents; but these patients are usually middle-aged women.

One of the chief functions of cheap dentistry, such as our men before enlistment must put up with for financial reasons, seems to be the preservation of carious stumps. The evil of these sources of sepsis is multiplied tenfold when they are covered by artificial dentures. I imagine that in the Regular Army carious teeth are not allowed to remain in the mouth. I should be glad to know if any stipulation is demanded of the candidate upon this point before he is enlisted. The conditions of our service in the Territorial Force make it difficult for the medical officers to ascertain that promises to that effect made by candidates are or are not fulfilled, and particularly for the reason that the family dentist often holds views upon the subject which differ from those of the medical officer.

In spite of its immense importance to general health, I would willingly have left the subject of pyorrhœa alveolaris unmentioned, for the reason that many medical men hold views so diverse and so very emphatic about its nature and prognosis that I fear it may monopolise the whole time at disposal for discussion. Although I have paid a good deal of attention to the subject, I propose merely to say that I do not very often find among the young male out-patients that form of progressive destructive pyorrhœa which denudes the mouth of teeth and leads to symptoms of general sepsis.

In uncleanly young men one often enough sees a tartar deposit about the necks of the teeth and an exudation of pus. It is usually found upon one side of the mouth only, that which is not used in mastication on account of an exposed nerve or root abscess, and

this condition can, I believe, be completely cured by the dentist without wholesale extraction. Such a case should certainly be referred to his dentist, and not be enlisted without re-examination, for a man with a dental abscess or septic gums cannot fail to go sick under circumstances of exposure, fatigue, and short commons.

Passing to the tongue and soft tissues of the mouth, I shall feel very grateful for guidance as to enlistment of men showing signs of syphilis. Hospital experience leads me to suspect that under conditions of privation a man with marks of tertiary syphilis is not a good life. Naturally in the hospital it is the therapeutic failures which we see, and they come again and again with recurrent outbreaks of trouble. I should be glad to know the opinion of those whose experience of syphilis is much larger than mine, whether I am correct in thinking that syphilitic stigmata of any kind render the candidate "unfit," almost as unfit as if evidence of tuberculosis existed. In the instructions for Territorial medical officers it is only laid down that indications of constitutional syphilis should exclude. Should not syphilitic cicatrices also exclude?

It was with the greatest pleasure that I heard the other day an officer of the Royal Army Medical Corps say that the first thing he did with his recruits was to "snap out" their tonsils. Practically, all enlarged tonsils in adults are septic, and remain enlarged because of the presence of septic *débris* in their crypts, and so definite and immediate is the effect of this sepsis upon the general health and nutrition of a patient that, in making a choice between two candidates, both of them on the border-line of general physical unfitness, one of them possessing and the other not possessing septic tonsils, I would pass the man with the tonsils and reject the other. One would look forward with confidence to a remarkable improvement in all respects within two or three weeks of operation. I do not know if it is the case in the course of the health-giving life of a soldier, but certainly in ordinary civil life septic tonsils involve slight attacks of inflammatory exacerbation every few weeks, often accompanied by rheumatic pains in the limbs and followed by marked depression of spirits and vitality, and a definite proneness to succumb to various forms of infection. In addition there is a general chronic septic intoxication, as well as local trouble in the stomach. All these symptoms immediately disappear on removal of the source of sepsis, but the removal must be complete.

In my opinion it is the exception rather than the rule to get complete permanent cure in adults without a radical operation. Occasionally one meets with a perfectly salient tonsil which with the use of a comparatively blunt Mackenzie guillotine can be removed *in toto*; but as a general rule ordinary tonsillotomy in adults leaves behind so much of that portion of the gland contained in the supratonsillar fossa—that is to say, in the pyramidal cavity separated from the buccal cavity by the upper convergent ends of the faucial pillars—that the patient gains practically no benefit. I think it is not too much to say that a majority of adult patients who seek advice for chronic tonsil troubles have already undergone the operation of tonsillotomy. These patients are said to have “flat” tonsils incapable of further removal with the tonsillotome. As a matter of fact, the tissue which remains forms so large a mass that the crypts which transverse it are often an inch in length, and correspondingly troublesome from the septic point of view. They may be removed by punching under cocaine—a lengthy and painful proceeding if done completely—but I think it is very much better to remove them whole with their capsules complete, so that the patient may be given a perfectly clean bill of health so far as these organs are concerned.

The operation is a simple and speedy one, and, if certain precautions are taken, it has never in my experience been complicated with hæmorrhage. The operation may be performed almost bloodlessly by seizing the tonsil with a blunt pair of forceps previously threaded through the wire loop of a strong nasal snare, and dragging it towards the middle line. The mucous membrane at the boundary of the gland is then broken through with a curved blunt instrument (a pair of scissors curved on the flat and used closed serve every purpose), and with a sweep downwards, both in front and behind, the gland is detached from its loose fibrous attachments and emerges from between the faucial pillars as a ragged cauliflower-like mass attached only in the lingual region. This mass is now pinched off with the snare and brought away in the forceps, and, if, after removal, it is reinvaginated, it will prove to be a compact, almost spherical body, limited in all but its buccal aspect by a clean fibrous capsule (specimen shown). Care must be taken to use blunt instruments, for if sharp incisions are made in the anterior or posterior pillars, hæmorrhage will result. During the first few essays it is well to employ a light chloroform anæsthesia in the sitting posture. Submucous injections of cocaine and adrenalin are attended with danger and have been responsible for fatal results.

I venture to say that any surgeon after a little preliminary experience, and with the assistance of a competent anæsthetist (an important point), would be able to clear off twenty cases in a morning and have his men fit for light duty on the fourth day. Unless I have been misled in my facial diagnosis of several battalions I have seen on parade, a morning's work of this kind would not merely relieve the regimental medical officer of attending to a large number of petty ailments, but change the whole physical bearing of many young soldiers. I can only say that I have seen many scores of people living under fairly favourable conditions change from being valetudinarians into robust and capable citizens after the removal of this apparently unimportant source of chronic sepsis. Consequently I would urge the acceptance of men suffering with chronic tonsillitis and insist on operation at the earliest opportunity.

At the recruiting age, enlargement and sepsis of the pharyngeal tonsil is not very often seen, but unfortunately the facial deformity resulting from the neglect of adenoids during the period of childhood is only too common. It has been said that the narrow, pinched nose, the deformed upper jaw, with its irregular teeth and the accompanying absence of mental alertness, are the stigmata of a race in process of degeneration and decay. I cannot for a moment believe this, and for two reasons: In the first place, this deformity—the adult adenoid facies—is more common among Londoners than in any other community, and this community is perhaps as mixed in blood as it can well be. Moreover, in many other parts of England which claim no special racial character, but where the climatic and social conditions are much better than in London, the adenoid facies is rarely seen. In the second place—and this is the important point when recruiting is the question in hand—one is constantly seeing young men with marked adenoid deformity, develop, after restoration of nasal potency by operation, in a very remarkable degree. If one of these patients is treated in a suitable manner at the age of 17 or 18, his palatine deformity indeed will not improve, but the development of his chest will rapidly proceed, together with his general well-being, and he will speedily commence to lose that mental hebetude which was previously so characteristic.

I need not point out that the man who has grown up with nasal obstruction and an open mouth not only looks stupid but is actually stupid. He lacks the power of mental concentration, and with it the faculties of memory, receptiveness, and initiative, and is quite unfit, on these grounds alone, to make a good soldier.

One of the clearest-headed men that I know, a great financier at the age of 30, master of four or five languages, and of the political and economic conditions of every country in Europe, is perhaps one of the most marked examples of the adenoid facies that one could see ; and I have reason to believe that he owes his release from the mental bondage which seemed to be in store for him to the fact that his nose was operated upon during his teens and his nasal respiration restored. This is only one instance out of many where I have seen a nasal operation wholly alter a man's standing in life, and the point I wish to press is this : that no young man should be refused enlistment on the score of mere nasal obstruction. Indeed, I believe that one may expect to make a valuable soldier out of any youth who, in spite of defective nasal respiration, has the grit and physique to wish to join the Service. I am unwilling to take up time this evening by a condensed and unsatisfactory description of the varieties of nasal obstructive deformities ; any text-book will furnish the details to those who do not already possess a knowledge of them ; and I will merely say here that the cramped and narrow nose is the result of habitual mouth-breathing during the period of rapid facial development between the ages of 6 and 12—the consequent withdrawal of the pressure of the tongue upon the palate, and the absence of one of the chief mechanical factors in the moulding of the hard palate. The result is a narrow, pointed alveolar arch, and a narrow roof to the mouth means a narrow floor to the nose. The nasal turbinate bones grow to their normal size and obstruct the nose, which is not large enough to contain them. Moreover, the nasal septum grows with normal rapidity, and, finding itself confined within limits abnormally small, must needs crumple and bend just, as Mr. Stephen Paget has said, like a letter which is too large for the letter-box.

It is to-day perfectly easy, with a little experience and a modicum of judgment, so to operate upon one of these cramped noses that the air-passages are enlarged to normal proportions. I use the word "judgment" because I know by experience that an injudicious operation may put the patient in a worse case than he was before it ; and I would especially emphasize the view now adopted by all rhinologists, that extensive removal of the inferior turbinated body—an organ whose important function it is to moisten and warm the inspired air—is to be strongly deprecated. It is now the practice to remove as little as possible of the valuable mucous membrane, and to resect, by the submucous method, merely

the excessive or deformed portions of the unimportant bone and cartilage.

I would gladly describe these operations if time permitted, but perhaps it will be better for me to say that they are easy of performance and entirely free from danger; that is to say, easy and harmless in the hands of those who have experience of certain technical details, which may be acquired by a month's study in a special department. I trust I am not indiscreet in suggesting that an occasional week's work on the part of one of the Royal Army Medical Corps officers who have attended the special course of study on this branch of surgery would not only relieve the drill serjeants of a training station of an infinite amount of fruitless labour with dull-headed young soldiers, but would open the door to a large number of candidates for enlistment who would otherwise be rejected for mental and physical deficiency.

So large is the proportion of defective men with nasal obstruction in this country of rain, fog, shut windows, and catarrh, that I believe the question of their cure is not merely a military but a national one; and the point I wish to make is that they can be restored, by a little operative interference, to the platform of efficiency, more particularly if the operation is to be followed by the favourable hygienic and gymnastic conditions which are the lot of the young soldier.

In the Instructions to Territorial Medical Officers it is laid down that they should examine candidates for nasal polypi. In a large out-patient department, recruited from a considerable section of England, I have at this moment only two men of recruiting age with nasal polypi. In a word, though I quite agree that such candidates should be rejected, because they cannot be considered cured until two years have passed without recurrence after removal, I do not think that this question comes into practical importance.

Men with purulent discharge from the nose certainly should not be rejected before examination at the hands of a specialist. To put it somewhat roughly, chronic nasal discharge in a man of recruiting age is due to ozæna, to syphilitic necrosis, to foreign body, to dental antral disease, to influenzal antral empyema, and to ethmoidal and frontal disease. The ozænic and syphilitic should, I believe, be rejected at sight; the second couplet—foreign body and dental antritis—will be cured in five minutes and five days respectively; the third couplet, the cases of sinusitis of nasal origin, may or may not be curable without delay or expenditure

of much energy, but the problem can easily be solved by a surgeon of a few months' experience. It is merely a question of judgment, and this judgment is now at the disposal of the recruiting medical officer, thanks to the facilities for specialisation which to-day are available.

To complete the topic of nasal troubles, I would like to say that I think that the subjects of hay-fever, dust rhinorrhœa, and asthma should be rejected on account of the nervous instability which underlies these phenomena, but to add that these cases will not present themselves in any appreciable numbers among recruits of the Regular Army, seeing that they are attributes of the so-called cultivated classes. In sixteen years' experience in special departments I have seen but one case of hay-fever in a genuine hospital patient; the remainder have all been in school teachers and unsuccessful exponents of the arts.

The neurotic element in hay-fever leads me to say a word concerning stammering. I need not point out that stammering is essentially due to a failure of the central nervous system to succeed in co-ordinating the functions of phonation and articulation which together make up speech. The phenomenon is not due to any structural defect in the throat or mouth, and cannot be attacked by operation. It can only be cured by making the patient realise and understand the error in his method and by his constant practice of certain tricks until they become involuntary through habit. This process of education is a long one, and in a man of recruiting age and class it is likely to be too lengthy and exacting to be of practical value. I am, however, not at all certain that all stammerers should, for this reason, be rejected as recruits. It is well known that stammering disappears on the attempt to sing, and I have been told by several young officers who habitually stammer, that their defect never troubles them on parade. It is not difficult to understand this, for the common form of stammering is due to a fruitless attempt either at putting voice into initial consonants which should be voiceless or at articulating voicelessly those that must contain voice. In singing or shouting these abnormal efforts are so far out of reach that they cease, as it were, to be a source of temptation and so are not attempted. Stammering, therefore, will not prevent the soldier shouting his number on parade, though it may place him in difficulties in the orderly room. The question, to my mind, seems to be one for the combatant officer to decide, where the candidate is an otherwise desirable one; and in my experience the majority of stammerers are men of intelligence and

endowed with amiable qualities above the average. It would, I think, be quite out of the question to expect the medical officer to cure the defect after enlistment. If a commanding officer accepts a stammerer he should undertake to keep him as such throughout his service.

A young man with an actual vocal defect should be viewed with great suspicion. A larynx which shows the least sign of syphilis should, I believe, be rejected; and where abnormal voice or marked laryngeal catarrh is associated with even the most doubtful physical signs in the chest, it will be best to reject, or at least to postpone enlistment, on the score of possible tuberculosis.

Nowadays a good many youths suffer with chronic laryngitis from cigarette smoking. If excessive smoking is admitted, it will, I believe, be wise to enjoin a period of three weeks' abstinence, and only to pass the candidate as fit if a very marked improvement is found on re-examination. Pachydermia laryngis, or chronic thickening of the epithelium, particularly upon the vocal processes, may be the cause of huskiness. The condition is, however, very rare at recruiting age, and is not uncommonly associated with alcoholism and fibrotic changes in the important organs; it should therefore, I believe, form good ground for rejection. Singers' nodules, due to excessive and improper use of the voice under bad hygienic conditions, may occasionally produce defective phonation in young men—usually board-school teachers and music-hall singers. With the change of vocation the defect will, as a rule, disappear, and it should not necessarily be considered in itself ground for rejection.

Passing now to the ear in its recruiting aspect, I shall say nothing upon the degree of hearing demanded in this and in other armies: that question can only be determined by officers of experience. I cannot, however, help feeling that a definite standard, such as that adopted by the Austrian and German armies, must be a source of convenience to the medical officer, as well as a safeguard against subsequent recriminations at the hands of higher authorities.<sup>1</sup> If a standard is adopted, certainly the whispered

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<sup>1</sup> The regulations for the Austrian and Prussian armies will be found in the latest German edition of Politzer's "Diseases of the Ear"; the American translation omits them. In Austria, hardness of hearing, which permits hearing of an accentuated whisper at 4 metres distance for either ear, or 2 metres for one and six for the other, entails full military fitness. A distance of 2 metres with either ear is sufficient for certain branches of the service. In Prussia slight deafness (4 to 1 metres) in one ear is passed as "fit," and for certain branches "slight deafness" in both ears, or marked deafness (under 1 metre) in one, is sufficient; for the "Landsturm" the standard is even lower.



speech is the best form of test, for the type of deafness that can hear speech and fail to hear the sound of a telegraph ticker is not commonly found below the age of 50. A man between the ages of 17 and 22 who can hear the whisper satisfactorily and equally in either ear may safely be passed; but when inequality exists, even though the less good ear is not severely deaf, a careful scrutiny should be made. Under such circumstances the medical officer will no doubt in all cases make a careful inspection of the organ through the speculum; but if he find no wax or other obstruction in the meatus, and no perforation or gross deformity of the drumhead, I cannot help thinking that he would be wise in referring the case to an officer who has been through the special course. I venture to make this suggestion because the diagnosis between the two most likely causes of the defect—namely, between chronic middle-ear catarrh and primary otosclerosis—often entails an examination lasting fully an hour, as well as a complete acquaintance with a score of differential tests. The one disease, if slight, may be immediately cured by the mere removal of the original cause, often enough some form of nasal obstruction; the other—otosclerosis—is a progressive disease, the exact pathology of which we do not yet understand, and which will with certainty be rapidly increased under the stress of fatigue and privation. Again, the catarrhal disease may have reached such a stage that effective cure is beyond reach; questions such as these occupy half the energies of expert aurists, and it is too much to expect of the Royal Army Medical Corps officer, with his multifarious duties, that he should waste his time over so tangled a problem. On the other hand, it seems undesirable that valuable recruits should be lost to the Service for the lack of an examination which would be a source of interest to those who are studying the subject. There should be no difficulty in the large recruiting centres in obtaining the assistance of such officers.

An important point which they will have to consider is the fact that men with chronic catarrhal changes in the ear are more prone than others to become seriously deaf under the influence of gun-fire. Permanent deafness from this cause is, however, chiefly seen only in those who for prolonged periods are constantly under this influence, and, so far as the Army is concerned, it is a question which applies to gunnery instructors rather than to recruits.

Granted, however, that this expert assistance is not forthcoming, I think that an examination with the speculum should always be made where deafness exists. There is an impression in the minds

of most medical men that wax in the meatus, uncomplicated with deep-seated trouble, does not cause deafness from speech. In a measure this is quite true, but the actual fact is that the degree of deafness is determined by the position of the mass of wax. Many cleanly persons imagine that by screwing the corner of a pocket-handkerchief into the meatus they will keep the ears clean. As a result they gradually ram the natural secretion inwards until it presses upon the drumhead and causes severe deafness, and we may almost with truth say that until this hygienic error is eradicated from the community, the degree of their deafness is a measure of their cleanly instincts and of their desirability in one respect as recruits.

Another meatal source of deafness is the presence of hyperostosis, which produces a variable degree of stenosis of the canal, and deafness when even a small quantity of wax has accumulated. This condition is practically always due to excessive bathing, especially in the sea. I happen to have had a very large experience of these cases, and following the advice of one of my early teachers I have never interfered surgically with any of them. As a result, I have in sixteen years not seen a single one of these cases lapse into serious trouble, the sole treatment being the cessation of bathing and wetting the meatus, and the annual removal of wax when necessary. Such cases may therefore, I believe, be safely passed into the Army, unless the stenosis is so excessive—and I have never seen it so in a young man—that a little swelling of the skin will cause complete obstruction and lead to retention of discharge in the event of acute middle-ear inflammation and perforation of the drum.

The question has been raised whether any candidate with chronic or recurrent discharge from the ear should be passed as fit. These middle-ear discharges are the result of infection from three sources—the meatus, the naso-pharynx, and the mastoid antrum—and the answer to the problem in any particular case lies in the culpability of one of these sources; for in a man who has the vitality to become a candidate we may exclude suppuration of the labyrinth and tubercular caries of the ossicles as sources of reinfection. It will, I am quite certain, be a safe and invariable rule to reject every man who has a perforation either in Shrapnell's membrane or in the posterior superior segment of the tympanic membrane. Such a patient has most likely a septic infection of his mastoid antrum, and, though he may be perfectly safe under civil conditions, he is quite unfit for military service and may require a mastoid operation at forty-eight hours' notice.

A perforation in the antero-inferior segment is quite another matter. Theoretically, a mastoid antral discharge may find its exit by this route, but experience shows that in practice this is not the case. As a general rule, a perforation in this situation denotes a chronic catarrh in the post-nasal space, kept up by the presence of septic adenoids or of some nasal trouble which may be easily cured by a minor operation. Where no treatment has been sought by the patient the chronicity of such a perforation is often due to reinfection from the meatus, and a few days of antiseptic toilette will bring about complete cure.

The question becomes a complex one when the larger part of the membrane has been lost, and certainly in the absence of any gross nasal or post-nasal trouble such cases should be rejected in the bulk, although here and there a perfectly safe man will undeservedly suffer. There can be no doubt about the wisdom of rejection if any cholesteatomatous masses—that is to say, shed epithelium—are found in the middle ear or in the meatus, or if there is any history of attacks of pain. Such attacks of pain may possibly have been due to furunculosis of the meatus, but it will be prudent to assume that they were the results of inflammatory outbursts in a mastoid antrum more or less filled with septic epithelial *débris* and a permanent source of dangerous trouble.

The question of a case of chronic otorrhœa depends entirely upon the immediate cause of the chronicity, the meatal and Eustachian re-infections being safe for enlistment, while the mastoid cases should invariably be rejected. A man who has undergone the radical mastoid operation, and who comes up to standard from the point of view of audition, may be accepted without hesitation, for he is in a sense a better life from the aural standpoint than the intact individual. It is, however, wise to obtain a history of six months' freedom from discharge in such a case, as a safeguard against the presence of labyrinthine complication. A discharge of mucus from time to time from the Eustachian region of the middle ear is, however, no source of danger after a mastoid operation, and a candidate with this condition may safely be passed as fit.

In making the foregoing suggestions the question has been present in my mind whether, under special circumstances, the existing standards may not safely be modified. The present regulations are the outcome of many centuries of experience, and to criticise them would be both an impertinence and a folly. It is not for a moment my intention to commit that folly, but to

suggest that, when not merely a small army of picked men but a large defensive force is being recruited, the old military standards may be replaced by the standards of physical efficiency which obtain in civil life. At the time of the South African War I took a share in passing as fit for foreign service a batch of Volunteers some eighty strong. I passed them partly on the grounds of their efficiency in civil life and partly from personal knowledge of the men themselves on the march and under canvas. My ignorance of regulation standard was responsible for some 90 per cent. of these men being rejected at a second examination at the hands of Regular officers. They were, however, owing to shortage of men at the time, ultimately sent out as a batch to the war. Three weeks ago I met the officer under whose command they served for a year or more. He volunteered the statement that he could not wish to command a more capable and efficient lot of men, and that he lost but one of them from disease. A fact like this makes one wonder if the mesh of the regulation recruiting sieve is not too fine.

Passing to-day through a holiday crowd of West country miners, and looking at them from the recruiting point of view, I could not help seeing that a large proportion of the younger men would fall short of standard on the grounds of nasal obstruction and defective chest measurement. My companion, who knew all the men well, assured me that they were not only full of grit and character, but that they were hard-working in the extreme and that they never went sick. I left them, convinced that, with a little thought and trouble, they could all be made into very efficient, if not absolutely first-rate, soldiers; and it struck me that with the help of the drill serjeant and a few instruments, a Royal Army Medical Corps officer could easily carve them into shape.

#### DISCUSSION.

Major J. RITCHIE said: It was natural that medical officers of the Regular Army and of the Territorial Forces should approach this subject from different, and to a certain extent from opposite, standpoints. The Territorial recruit was a willing man, who could be trusted not to report sick with slight ailments. Not so in the Regular Army, where there drifted a large proportion of that loafer, unemployable class which was the despair of social reformers. These men were, of course, a very small minority in the Army, but their presence made it essential that no man should have an excuse to report sick whenever marches got toilsome or rations were decreased. He presumed that the Volunteers to whom Captain Waggett alluded went to South Africa early in the war. [The lecturer assented.] Such men, brimful of patriotic ardour, would stand

service for a year, though possessing defects which would rightly disqualify them for ordinary service. The Army standard might seem unnecessarily strict and too rigid, but while the demand is less than the supply, why should men be enlisted who might not only be useless but a positive hindrance to the advance of an army in the field? The requirements as regards teeth possessed by a recruit were quite explicit, and in his opinion did not err on the side of over-strictness. It was a matter both for surprise and regret that a better form of Army biscuit could not be invented; but while the present biscuit held the field, the possession of bad teeth should be an absolute bar to enlistment. Syphilis also should disqualify. The disease was only amenable to treatment when diagnosed at the earliest moment, and this would never be the case in the recruit. The speaker also thought no man should be accepted who had had a discharge from the ears, as in so many cases relapses occurred.

Lieutenant-Colonel MELVILLE thanked Captain Waggett for his interesting paper, which threw light on many points not, in his opinion, sufficiently paid attention to by officers of the Royal Army Medical Corps. He confessed that for his part this certainly was the case. In regard to what Captain Waggett had said about the incompatibility of the ration biscuit with the condition of the teeth of many otherwise sound men, Lieutenant-Colonel Melville said that this question was not a simple one. When one came to compressing bread-stuffs into small bulk, the choice practically lay between having something hard but durable, such as a ration biscuit, or crisp and crumbly like a rusk. The latter was the more palatable, and of course much the more easily masticated of the two. Once broken, however, it crumbled away rapidly, and could not for that reason be carried, broken, in the haversack, as can be done with broken biscuit. In reference to the general question of recruiting, he thought that we suffered from insisting too much on rigid standards. In the old days of shock tactics it was necessary to have men of uniform height and measurement on account of the moral effect of the wall-like appearance of a closed, well-sized rank. But in these days this necessity did not exist. He thought that men might be enlisted much more in the manner in which horses were chosen. The veterinary officer was not called in to select a horse, but only to decide if a horse which in the opinion of experienced horsemen was a good stamp of horse was sound. He thought that men should be enlisted in the same way. If experienced soldiers considered any man to be a good stamp of man, and of a good heart, and likely to be a good soldier, the medical officer should only be asked to see if the man were sound or not. Rigid standards of height, weight, and so on, were apt to be misleading if relied on to the extent that they were at the present day. A similar course might well be followed in the case of passing men as fit for active service. There were many men who, in spite of some slight defect, were, on account of being good-hearted men, more likely to turn out efficient soldiers in the field than sounder but less "plucky"

men. In any individual case of doubt the company officer was always the best judge as to whether the man were likely to be worth his field rations or no.

Major MOORE agreed with Major Ritchie as to the necessity for maintaining the strict existing standards for Line recruiting. In spite of these, the number of recruits who pass as fit but are subsequently discharged as unfit within three months for affections of the throat, nose, and more especially of the ear, is a large one, and is yearly increasing. (A.M.D. Report, 1907.) It was extremely difficult to fix a minimum standard for teeth in dealing with recruits. A study of the causes of breakdown of so many men in South Africa from intestinal affections showed that it was largely attributable to their defective powers of assimilation and mastication of biscuit and hard food. Since then medical officers have rightly felt chary about accepting men without a reasonable number of healthy and opposing molar teeth. Dealing with any men likely to serve abroad, and possibly on active service, for whom bread or flour ration might often be unobtainable, he thought that no modification of the existing standard would be advisable. He had seen striking results, on a somewhat large scale, follow the excellent practice advocated by Captain Waggett of complete removal of chronically enlarged tonsils in the narrow-faced, mouth-breathing type of recruit. The difficulties met with by recruits refusing the remedy of operation were now less frequently met with. He agreed that a recruit showing evidences of acquired syphilis should be rejected. The operative measures mentioned by Captain Waggett for the relief of conditions of mouth-breathing and nasal obstruction or insufficiency were invaluable, and were now being more and more employed in the Army. Old-standing cases of ear disease undoubtedly succeeded in passing as recruits, and later swelled the statistics of invaliding. In some out-stations the examination of recruits has to be carried out in the morning, sandwiched in between one's ward work and important daily routine duties. Under such circumstances it was impossible to thoroughly cleanse and examine the ears of all. Captain Waggett's suggestion that opportunities might be afforded to medical officers to take out a short course at a throat and ear clinic was most practical, and one which he hoped might be adopted.

Fleet-Surgeon H. W. G. DOYNE, R.N., said that the conditions at the Admiralty Recruiting Department were so strict during the time he was doing duty there that no man was allowed to be entered with any defect. He was much interested in the lecture, and thoroughly agreed with the comments made by the first speaker (Major Ritchie).

Fleet-Surgeon W. W. PRYNN, R.N., said that in the Navy, as far as officers were concerned, there were no standards as regards height, weight, and chest measurements. Executive, marine, and engineer officers were now entered between the ages of 12 and 13, and the examining medical officers exercised their discretion as to whether it was likely that the candidate would develop so as to become an efficient

officer. He was of opinion that any surgical operations which might be necessary should be performed before acceptance, and that any manifestation of active syphilis should cause rejection. At the Medical Department of the Admiralty it was the custom to examine ears with the auriscope as well as to test the hearing with the whispered voice. As regards stammering, he thought that an officer so afflicted was more or less dangerous, while in a man it was not of so much consequence, and to a certain extent it was a matter in which an examining medical officer might exercise his discretion.

Major A. P. BLENKINSOP said: The question of the advisability of enlisting men suffering from syphilis has been more than once raised during the course of the discussion. So far as recruiting for the Regular Army is concerned, we are definitely forbidden, and, in my opinion, very rightly forbidden, to enlist recruits who show signs of constitutional syphilis. Such men have undoubtedly damaged lives, and they are likely to break down under the strain and hardship of active service. Then, again, a combination of syphilis and malarial fever is about the most terrible combination of diseases one can possibly have to deal with, and therefore syphilitics run very grave risks if they are called upon to serve in malarious countries. I do not think we are justified in enlisting men for general service who are victims of this constitutional disease. Another question which has been brought forward, is whether we should enlist men with defective teeth, and it has even been suggested that such men should be provided with artificial dentures on enlistment. I am of opinion that it is very bad policy to pass any man into the Service who could not masticate the Army biscuit and field-service ration without artificial aid. Artificial dentures may be lost or broken, either by accident or design, and then an individual who is dependent upon them for chewing his food at once becomes useless for active service in the field. Our experience during the late war in South Africa taught us how very severely a soldier with defective teeth is handicapped as a fighting machine. With regard to the enlistment of recruits who are suffering from defects which we might hope to cure by operation, I think it is a mistake to pass men of this description. A man who becomes "fed up" or unduly nervous on active service can always state that he has pain or other trouble in connection with an old operation wound, and he would be a bold medical officer who would definitely certify that the statement was unfounded. So long as sound men can be induced to offer themselves for enlistment, we should reject any of these lame ducks. A soldier is kept for one purpose and one purpose only, and that is for active service. If he is not fit to take his place in the fighting line, he is not only useless but an actual encumbrance, and any money spent on his training or maintenance is money wasted. Of course, my remarks chiefly refer to men who would be liable for general service. A lower standard of physical efficiency might be adequate for Territorial recruits.

## Clinical and other Notes.

### SUCCESSFUL SPLENECTOMY FOR RUPTURE OF LARGE MALARIAL SPLEEN IN EUROPEAN BOY.

BY MAJOR M. P. HOLT, D.S.O.

*Royal Army Medical Corps.*

ALLAN J., pure European, aged 10, was brought to hospital about 11 a.m. on February 28th, 1909, at Ambala, in a state of collapse; extreme anæmia, restlessness, and other symptoms pointed clearly to severe hæmorrhage. The history stated that he had fallen across the wooden sill of the cookhouse at 2 p.m. the previous day; that as he complained of severe pain shortly afterwards, his mother had put him to bed to keep him quiet, and that after a restless night, spent lying on his back with his knees drawn up, "he looked so white and ill" that his mother sent for a doctor. He had vomited only once, shortly after the fall. He had suffered much from attacks of malaria during the past few months.

On admission, the abdomen was much swollen, very tense, and tympanitic everywhere except in both flanks; pulse 140, thready; temperature 99° F.

*Operation.*—Under  $\text{CHCl}_3$  median laparotomy was performed. The abdomen was full of blood, the spleen, very large and soft, was found split right across the middle from back to front. The spleen was removed in the usual way, but as rapidly as possible, owing to severe state of collapse of the child. The recovery was quite uneventful; there was no attack of ague until four weeks after the operation. No malarial parasites were discovered in the spleen. The spleen after removal weighed exactly 16 ounces (the normal for child this age being about 3½ ounces).

The boy on discharge from hospital on March 30th, weighed 3 stone 1 lb.; on May 22nd he weighed 4 stone 10 lbs. He has obviously grown a lot and has filled out considerably even within two months.

Those who have seen cases of ruptured malarial spleen in India—generally in natives—will agree that it is unusual for the patient to live more than a few hours, or even in some instances more than a few minutes. In the present instance it must be a subject of congratulation that the child did not die during the night, when the parents thought there was little the matter with him, and accordingly paid little attention to him. Some apprehension was felt as to what would be the result should the previously customary severe attacks of malaria occur. On the first re-appearance of ague he was given 5 grains quin. hydrochl. intramuscularly, and nothing further occurred for some time, when another ague attack occurred.



Cases of splenectomy for rupture are not uncommon, but recovery after rupture of an enlarged malarial spleen seems to justify putting the case on record.

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### BACILLURIA.

By MAJOR C. E. POLLOCK.

*Royal Army Medical Corps.*

SOME dozen cases of this affection have been under treatment in Malta during the last two years. As the literature on this subject is not extensive, and the condition is one which may easily be overlooked, I am publishing these notes in order to call attention to the advisability of examining the urine in cases of mild pyrexia, especially when the patient complains of irritation on passing water. In my limited experience I have found that these cases, if recognised and treated at an early stage of the disease, are easily cured, but if allowed to run on may prove most intractable and cause much suffering to the patient.

*Symptoms.*—The usual history is a slight exposure to chill; soon after a sense of lassitude and general *malaise* comes on, with perhaps a mild rigor. The temperature rises in the first twenty-four hours to 100° F. or even 102° F., and there is considerable irritation about the perineum, with dull pain over the bladder. The act of micturition is always more or less painful, sometimes excruciatingly so. If untreated the pyrexia lasts for about a week or even longer; the urethral irritation, on the other hand, may almost disappear for a short time, only to return in an aggravated form.

*Cause.*—In one case the exciting agent was a staphylococcus, but in all the others a coliform bacillus was present. Captain Babington, R.A.M.C., made cultures in two of the cases: one proved to be para-typhoid "A" and the other *B. coli communis*. Nearly all our cases were married men; in so small a number, however, this may have been an accidental coincidence.

*Treatment.*—The essential conditions for successful treatment are rest, (preferably in bed), a non-irritating diet, *e.g.*, barley water, milk, milk and soda, milk puddings, porridge, &c., till the urine is clear and all symptoms have subsided. Alcohol and red meats should not be allowed till the patient has been apparently cured for at least a fortnight; all the cases showed a tendency to relapse when the diet was increased too soon. The drug which we have found to be almost a specific in Malta is urotropine. At least a drachm a day should be given to begin with; when the urinary discomfort has disappeared the amount can be reduced to half that quantity, but should not be entirely suspended till the patient has been allowed full diet, and no ill consequences have ensued.

Next in value to urotropine comes boric acid which, however, tends to produce a mild form of dyspepsia; quinine has some beneficial action,

but not a powerful one; benzoic acid ought to be of service, but I have not tried it in these cases.

I append notes of two cases, one mild and the other of unusual severity.

(1) Captain D. Reported sick on March 10th. He stated that the day before he felt perfectly well and had been on duty on one of the range steamers watching gun practice; the day was cold, but he did not feel any definite chill at the time. In the evening he felt very seedy and shivered once or twice, so went to bed. When I saw him his temperature was 99° F., the skin was moist, the tongue clean, and there was only slight headache. Micturition was rather uncomfortable, there being some burning on passing water, which was high-coloured and of the usual febrile kind. As this officer had contracted malaria on the West Coast of Africa two years previously, I at first suspected a slight return of this, and gave him quinine. The evening temperature rose to 101° F., but otherwise he felt better. On March 11th the morning temperature was still 101° F., and as he was somewhat constipated I ordered him a smart purge, which acted well but failed to reduce the evening temperature. A blood film was examined for malarial parasites, but none were found, and a sample of blood failed to give any serum reaction. The temperature slowly dropped, and on the morning of the 13th had reached normal; the act of micturition had, however, again become quite painful. A sample of urine examined by Captain Babington was found to contain *B. coli communis*. He was accordingly ordered urotropine, as stated above. This was followed by an almost immediate disappearance of the urinary trouble, and in three days he was able to return to duty, treatment being continued for a couple of weeks. I have no doubt that this was a case of bacilluria, from the start; the urinary symptoms were, however, of such a mild character that I attached too much importance to the history of malaria, and so at first failed to recognise the true cause of the malady.

(2) Major P. On the night of August 18th this patient had to get up several times to close windows, owing to a high wind which suddenly arose, and caught a distinct chill while doing so. Next morning his temperature was 99° F., and he felt generally ill. During the afternoon micturition became very frequent and the desire could not be in any way resisted. The act was very painful, only a few drops of scalding urine being passed at each attempt, which was immediately followed by an intensely painful spasm of the whole urethra. The evening temperature was 101° F. During the night the desire to pass water recurred every few minutes, sleep was impossible, and the urine passed was deeply tinged with blood. The urethral sensation suggested the slow passage of a urethral calculus, and accordingly, next morning, under cocaine, an endoscopic examination was made with negative results. The general symptoms continued, and the officer was admitted into hospital. A sample of urine was found to contain an enormous number of coliform

bacilli. Blood samples failed to give any serum reaction. As there was a history of malaria quinine was given at first; this, together with a plain milk diet, produced some relief of the most urgent symptoms. Pyrexia, of the simple continued fever type, persisted till the morning of the 25th, when the temperature fell to normal. On the 27th a sudden attack of painful epididymitis came on together with a return of the pyrexia. Urotropine was now ordered in full doses. Improvement began at once, the temperature fell to normal again in three days, and the urine became clear although it still contained quantities of bacilli. On September 6th, the epididymitis having subsided and micturition being no longer painful, he was discharged hospital to do duty and continue treatment outside. Two days later the urine again became thick, severe lumbar pain set in and he felt ill, the temperature also rose to 99°. The officer remained at duty till September 27th, during which time the symptoms continued with varying severity, the urine being sometimes clear and sometimes thick, but always containing bacilli. On this date severe testicular neuralgia came on and a suspensory bandage had to be worn; the urine also was tinged with blood. He was placed on the sick list. Strict diet, together with urotropine and boric acid, was ordered. Improvement quickly set in, but the symptoms did not entirely clear up for another month. At intervals small oblong masses of orange-coloured matter somewhat resembling gold fish were passed twenty to thirty at a time; these consisted of mucus, pus cells, and blood corpuscles with some bacilli. In all probability an ulcer had formed in the bladder and these were sloughs from the surface. Treatment was continued till the middle of December, after which there was no further recurrence.

This case was an exceptionally severe one, but there is little doubt that if the true cause of the disease had been recognised in the first instance the malady would have been of much shorter duration and the patient would have escaped a good deal of unnecessary suffering.

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#### A CASE OF PERFORATED GASTRIC ULCER—OPERATION—RECOVERY.

BY CAPTAIN J. G. CHURTON.

*Royal Army Medical Corps.*

LIEUTENANT F. was sent from Bordon into the Cambridge Hospital on May 5th, 1909. A note from his medical officer stated that at 7.15 the evening before he was suddenly attacked by acute abdominal pains and was collapsed. Brandy was administered and fomentations applied to the abdomen. At 9 p.m. tinct. chloroformi et morphina was given, but he vomited immediately afterwards. At 11 p.m. some improvement had taken place, pulse fair, pain not so intense; morphia  $\frac{1}{4}$  grain was given hypodermically. Passed a disturbed, restless night. Next morning

some pain still present, more particularly over right side of abdomen and right shoulder-blade; some rigidity of right rectus muscle; has had no food; general condition very fair; a simple enema had no effect.

*Previous History.*—Since Christmas, 1901, patient has had "attacks of indigestion" at varying intervals, each attack being of six weeks' to two months' duration. These consisted of pains in the upper part of the abdomen, coming on some hours after food, and at first relieved by eating. In April last he began to notice that eating no longer brought relief, but rather tended to increase the pain. For several days before the sudden violent attack of pain there had been greater discomfort. On Tuesday, May 4th, he did his work as usual in the morning, had a light lunch and went to some sports in the afternoon, where he only had a cup of tea; returned to his room about 7 p.m., and had just sat down when he was suddenly seized with a most acute spasm of pain across the middle of the abdomen, followed by a pain all up the right side and considerable difficulty in breathing and was unable to straighten himself. He at once sent his servant for the medical officer.

*Condition on Admission.*—When I first saw the patient on the afternoon of May 5th, shortly after admission, he appeared to be quite comfortable, lying on his back, though his expression was a little anxious. He complained of a not very severe continuous pain extending from the right iliac region up to the right shoulder, which was increased by taking a deep breath. His temperature was 101° F., pulse 104, respirations 28. The tongue was furred but moist, and he complained of thirst; the abdomen was not distended; respiratory movement was somewhat diminished, particularly in lower half of the abdomen; there was some dullness to percussion in the right flank. On palpation there was no marked rigidity, though there was some resistance, which was more evident over the right side than the left, particularly over the right iliac region, where distinct tenderness existed. The liver dullness was normal; the heart sound was normal; over the whole of the base of the right lung fine crepitations with diminished breath sounds were heard. On the above evidence it was somewhat difficult to arrive at a definite conclusion at the time; so it was decided to wait and watch the progress of events, having everything prepared for an immediate operation should this prove necessary. In the meantime he had nothing but small quantities of albumen water, and an enema was given with good result. The same evening there was no change, except that the temperature had gone down a little; he passed a fair night. Next morning, however, as the abdominal signs had increased—there was a further limitation in the respiratory abdominal movement, more distension with increased rigidity and tenderness up the right side of the abdomen, and an increase in the pulse-rate—I decided to operate.

*Operation.*—An exploratory incision was first made over the appendix region, when it was soon seen that the appendix, though inflamed, would

not account for the peritonitis which was present, and appeared to extend from above; so a second incision was made longitudinally through the middle of the upper portion of the right rectus muscle, and the muscle displaced inwards. The peritoneal cavity being opened and the intestines packed off, it was at once evident, from the extensive deposit of lymph in the neighbourhood of the pyloric end of the stomach, that here was the seat of the trouble, and in a short time a perforation—which would admit the end of one's little finger—was discovered situated on the anterior surface of the stomach, close to its pyloric end, and about midway between the greater and lesser curvatures. For some distance round the ulcer the stomach wall was densely indurated, particularly towards the pyloric end. This made it very difficult to get the sutures to hold, and the question of excision of the ulcer was out of the question. Eventually, however, the hole was obliterated, and for additional safety a piece of omentum was drawn up and anchored over the site of the ulcer. Hot moist swabs were then applied to the peritoneum in the neighbourhood of both wounds where there appeared to be any turbid fluid, and finally drainage tubes with gauze wicks were inserted—one in the vicinity of the ulcer, through the upper incision, another into the right renal pouch, and a third into the pelvis, the two latter being placed in the lower incision; both wounds were then closed. Immediately after the operation patient had a saline enema, which was repeated twice during the night, and after coming round from the anæsthetic he was propped up in bed.

*After-history.*—For four days he had nothing by the mouth except a little ice to suck; a mouth wash and occasionally sips of warm water were given. Subcutaneous injections of normal saline solution were administered twice daily, and nutrient enemata six-hourly. After the fourth day feeding by the mouth was commenced. At first only small quantities of albumen water and peptonised milk were given, and the nutrient enemata were continued. Later on, as the quantities by the mouth were increased, so the nutrient enemata were discontinued, and by degrees he was able to take more elaborate dietary without discomfort. In fact, except for a little pleurisy over the left lung behind, his progress towards complete convalescence has been uninterrupted.

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#### “TRAITEMENT À VIDE” OF ENTERIC FEVER.

BY LIEUTENANT-COLONEL G. CREE.

*Royal Army Medical Corps.*

In the October number of the *Journal*, 1908, there is a clinical note by Major Johnson on his experiences on the “*Traitement à vide*” of enteric fever, with a list of eight cases, which calls for a vigorous protest from those interested in what surely must be looked upon as the only rational method of treatment of enteric fever at the present time.

Though the line of treatment recommended by Captain Carter and myself in the Journal (vol. vi., p. 164) differs in many of its details from that so clearly expounded by Dr. Ewart, the general principles are the same, and I hoped that someone who had perhaps had more recent opportunities of using it would have risen in his wrath to confound Major Johnson with his own experiences. As this has not happened I feel it is time that I championed the cause and brought forward my small battalion of successful cases in proof of our assertions.

Since the beginning of 1906 Captain Carter and I have had under our immediate supervision twenty-nine *consecutive* cases of enteric fever with *no deaths*. These cases were all treated strictly on the lines we described. They occurred, not in one epidemic, but during the course of three years and in three different stations. They were not all British soldiers, but consisted of officers, a woman, children, soldiers and a native. There had been a most noticeable absence of complications, and in two instances the patients were not admitted nor received any treatment till the second week of the fever.

Now what is the secret of the discrepancy in the results arrived at by Major Johnson and ourselves? This will be found, I think, in the opening paragraph of Dr. Ewart's remarks on the clinical note in question, where he says, "It does not appear that my method was carried out," and this has also been my unhappy experience. On many occasions when discussing the treatment of enteric with brother officers, both senior and junior, I have asked why the "*traitement à vide*" had not been tried, and the answer has often been, "But it has been tried and found no use." On further enquiry it has, however, invariably proved that in these "unsuccessful" trials an *occasional* dose of calomel, perhaps followed by castor oil—generally not—with milk whey given *in addition* to various foods, has constituted their ideas of the treatment. Happily there is another picture of those who have conscientiously carried out the treatment, and all such have invariably expressed themselves in glowing terms of their experiences.

It has always surprised me that there should be anyone who was unwilling to try a different way of treating enteric from those that have become "honoured" by long unsuccess, but the doctor is notoriously conservative in the practice of his profession, and, to many of them, to break away from a treatment that has received the sanctity of long usage savours of impiety. So long as we have no assured sero-therapeutical treatment at hand, though such must surely be a matter of but a short time now, I can only earnestly impress on those that have to battle with enteric that they have in the empty bowel method a plan of campaign that excels anything that has gone before, but in trying the treatment to do so not half-heartedly and with an uncertain hand, but to go the "whole hog" and carry it out to its uttermost trivial detail.

Serial number	Corps	Regimental number	Rank	Name	Age	DATES OF		Duration of fever in days	COMPLICATIONS			Result of Widal reaction, with date and day of disease	Whether inoculated with dates
						Admission	Final result		Hæmorrhage	Perforation	Thrombosis		
1906.													
1	2nd Cheshires	..	Lieutenant	S. ..	25	3.8.06	Sick leave England, 27.10.06	39	Yes	Nil	Nil	12th day positive, 15.8.06	No.
2	"	..	"	T. ..	20	7.8.06	Sick leave England, 27.10.06	20	Nil	"	"	10th day slight re- action, 17.8.06	"
3	"	..	2nd Lieut.	S. ..	20	7.8.06	Sick leave Ooty, 27.10.06	28	"	"	"	12th day positive, 19.8.06	"
4	2nd Royal Fusiliers	9356	Private ..	B. ..	24	16.4.06	To duty, 16.6.06..	23	"	"	"	Reaction could not be demonstrated owing to broth being acid	"
5	1st Manchester Regiment	9211	"	T. ..	20	17.6.06	" 16.8.06..	30	"	"	"	12th day positive	"
6	2nd Royal Fusiliers	10664	"	G. ..	20	18.6.06	" 16.8.06..	36	"	"	"	About 10th day positive	"
7	1st King's Lancers	6119	"	C. ..	24	18.6.06	" 16.8.06..	38	"	"	"	Positive 10th day	"
8	2nd Dorsets	6292	"	T. ..	24	7.11.06	Recovered ..	27	Yes	"	"	Positive 12th day, 19.11.06	"
9	13th Hussars	Child	..	B. ..	8	2.8.06	" 27.11.06	31	Nil	"	"	Positive 12th day, 9.8.06	"
1907.													
1	2nd Dorsets	7054	Private ..	M. ..	23	9.3.07	To duty, 15.5.07..	23	Nil	Nil	Nil	Positive Widal, March 11th	No.
2	2nd Royal Fusiliers	10729	"	H. ..	24	25.3.07	" 23.7.07..	48	"	"	"	Positive 8th day..	"
3	2nd Cheshires	6217	Bandsman	C. ..	20	25.3.07	Recovered, 14.5.07	25	"	"	"	Positive (1-40) ..	"
4	Military Farm Department	..	Serjeant ..	F. ..	35	27.3.07	" 3.6.07	26	"	"	"	" "	"
5	2nd Dorsets	7278	Private ..	D. ..	24	1.4.07	" 18.7.07	35	"	"	"	20th day positive Widal, 20.4.07	"

6	2nd Dorsets	..	7493	Private ..	F. ..	20	1.5.07	Recovered, 21.7.07	30	Nil	Nil	Nil	Positive 16th day	Widal	No.
7	Ordnance Department	..	..	Captain ..	C. ..	28	14.4.07	..	18	..	..	..	Positive (1-40) 12th day	..	..
8	2nd Dorsets	..	7726	Private ..	P. ..	22	10.5.07	..	21	..	..	..	Positive 12th day	Widal	9.10.06. Refused 2nd dose.
9	1st Devons	..	7970	..	K. ..	21	4.6.07	..	26	..	..	..	Positive 14th day	Widal	No.
1908.															
1	2nd Cheshires	..	8119	Private ..	W. ..	23	11.1.08	Recovered	..	37	Nil	Nil	Nil	Positive (1-50), bacilluria present	No.
2	Boys' Depot, R.F.A.	..	4775	Boy ..	P. ..	16	6.1.08	..	26.2.08	14	..	..	..	Negative (1-50), no bacilluria	..
3	2nd Cheshires	..	7554	Bandsman	G. ..	19	29.2.08	..	..	21	..	..	..	Negative in one, positive (1-50) on 2nd trial	..
4	..	..	8005	Private ..	M. ..	20	3.3.08	..	..	12	..	..	..	Negative (1-50) on three occasions	..
5	..	..	6691	Lieut.-Corpl.	M. ..	27	5.3.08	..	..	19	..	..	..	Slight agglutination twice (1-10) after 20 minutes	..
6	..	..	3685	Private ..	P. ..	31	21.6.08	Recovered; transferred to Welling-ton, 22.8.08	..	22	..	..	..	Positive (1-20) ..	Once in 1900.
7	..	..	8134	..	S. ..	23	9.6.08	Recovered; transferred to Welling-ton, 22.8.08	..	24	..	..	..	Positive (1-30) ..	No.
8	83rd Battery, R.F.A.	..	24823	Bombardier	R. ..	24	28.10.08	Recovered; transferred to Welling-ton, 23.12.08	..	17	..	..	..	Positive 2.11.08, (6th day of disease)	..
<i>Natives.</i>															
9	Army Hospital Corps	..	9135	Sweeper ..	K. ..	35	17.12.08	Recovered	..	38	Nil	Nil	Nil	Positive (1-96), 12th day of disease	No.
<i>Civil Cases.</i>															
1	..	..	..	Mrs. ..	M. ..	25	..	Recovered	..	14	Nil	Nil	Nil	Positive (1-30)	No.
2	..	..	..	Miss ..	Ellis	7	..	..	..	43	..	..	..	..	..



# A NOTE ON A CASE OF SIMPLE CONTINUED FEVER WITH RECOVERY OF AN INTERMEDIATE ORGANISM FROM THE BLOOD.

By LIEUTENANT T. W. SPENCER.

*Royal Army Medical Corps.*

PRIVATE —, R.A.M.C., was admitted to hospital on September 19th, 1908, with headache, malaise and moderate fever, which subsided after a few days' treatment. A week after admission the temperature again rose and continued to vary between 99° and 101° F. for fourteen days, when it gradually fell to normal with occasional temporary rises for a day or two at a time. Ten days after admission a small patch of consolidation was evident opposite the spine of the right scapula. The only physical signs were those of bronchitis, accompanied by scanty sputum, which did not contain the tubercle bacillus. Three weeks after admission pains in the bones and joints were complained of, the elbows and thighs being involved. The patient gradually became anæmic and the knees became painful—there was much mental depression. The concatenate, epitrochlear and inguinal glands became enlarged and the joints did not improve. His general condition became gradually worse and he was invalided for change, to England, three months after admission to hospital. There was no evidence or history of syphilis.

*Bacteriological Examination.*—On October 12th, three weeks after admission, 6 cc. of blood were taken from the arm and about 1 cc. incubated in five 100-cc. flasks of nutrient broth and two tubes of bile peptone. From four of the flasks, and both tubes, a pure culture of a bacillus was obtained which showed the following characteristics:—

*Morphology.*—A short, fat, non-motile bacillus self-agglutinating in hanging-drop specimens. Stained by ordinary dyes; negative to Gram.

## *Cultures.*—

Gelatin plate	..	..	No liquefaction in 4 days.
Glucose litmus peptone	}		Colour discharged in 24 hours. No other action.
Lactose			
Sucrose			
Mannite			
Dulcitol			
Litmus milk	..	..	Alkaline after 4 days.
Neutral red broth	..	..	Slight bleaching. No other action.
Peptone, salt	..	..	No action.

*Agglutination.*—Negative with typhoid, paratyphoid, A and B, and Malta fever sera.

*Animal Experiments.*—Non-pathogenic to rabbits and guinea-pigs.

Three weeks after the recovery of the organism from the blood it was again obtained from the blood in pure culture by a similar method. I am indebted to Major Fowler, R.A.M.C., for working out the cultural reactions, which were subsequently verified by Major Harrison, R.A.M.C., at Millbank.

## A CASE OF STATUS EPILEPTICUS.

BY MAJOR S. F. CLARK.

*Royal Army Medical Corps.*

SOME remarks on this case may be of interest, for, as far as my experience goes, the condition is not commonly met with in military hospitals.

The patient, a private in the Mounted Infantry, was admitted to hospital at Middelburg, Cape Colony, on March 6th, 1909, suffering from enteric fever. On March 8th he had two epileptic fits, each lasting a few minutes. His fever pursued an ordinary course, and he soon became convalescent. On April 29th he was ordered urotropine, and on May 6th and 8th his urine was examined and found to be free from albumin. At 8 a.m. on May 13th, while walking about the wards, he suddenly fell down and became rigid, his limbs and eyes began to work, and in about one minute from his fall he passed into a state of coma with stertorous breathing. By 8.15 he had had three fits of a true epileptic nature, and they continued with intervals of twenty to twenty-five minutes to about 4.30 p.m., by which time he had been given 80 grains of bromide of potassium, and 10 grains of chloral by enema,  $\frac{1}{2}$  and  $\frac{1}{3}$  grain morphia hypodermically, inhalations of amyl nitrite and of chloroform. From 5 p.m. to 7.30 p.m. no fit occurred, but at 7.30 p.m. they began afresh, and a further 30 grains of bromide and  $\frac{1}{3}$  grain morphia were given. All this time the patient had not shown the slightest sign of returning consciousness, and during each fit his face became deeply cyanosed and his pulse weak. To make certain that there was no suspicion of uræmia some urine was drawn off by means of a catheter and tested for albumin; practically none was found. From 7.30 p.m. to 1 a.m. on 14th inst. fits occurred at frequent intervals, and by the last-named hour they had totalled thirty-eight. From 10 p.m. his condition seemed very precarious, pulse very rapid and weak, and cyanosis during the fits very marked. Chloroform and amyl nitrite had been found to be useless in preventing fits, so bromide of potassium by enema and morphia by hypodermic injections were pushed to the verge of safety. Nutrient enemata had been administered at intervals ever since 10 p.m. From 3 to 4 a.m. on the 14th he had only two fits, and he then lay quiet but unconscious till 10 a.m. (May 14th), when he had a slight fit which turned out to be the last one. His final dose of morphia and of potassium bromide were now given, and soon afterwards it was found that he was able to swallow liquids. By 2 p.m. (14th) he seemed to be sleeping naturally, but he did not appear to regain proper consciousness until the morning of May 15th, when he said "Yes" and "No." It was not till the morning of the 16th inst. that he said anything else, and he then made an uninterrupted recovery.

His medical history sheet shows that on June 3rd, 1908, he was

found unconscious on the veldt at Standerton, and he was admitted to hospital there for concussion of the brain. The cause of this disability was never satisfactorily traced. At Middelburg he was under the care of Captain Hanafin, on whom the brunt of the treatment fell.

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## Report.

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### REPORT ON SEVENTH INTERNATIONAL CONGRESS OF APPLIED CHEMISTRY.

BY MAJOR W. W. O. BEVERIDGE, D.S.O.

*Royal Army Medical Corps.*

THE first meeting of the International Congress of Applied Chemistry was held in Brussels in 1894, and the seventh International Congress was held this year in London, from May 27th to June 2nd, for the first time in this country, under the patronage of His Majesty the King and his Royal Highness the Prince of Wales. Sir Henry Roscoe, F.R.S., acted as Honorary President, with Sir William Ramsay, F.R.S., as Acting-President, and Mr. W. Macnab as Honorary Secretary.

Altogether about 3,000 members and over 600 ladies attended the Congress. Delegates from practically the whole civilised world were present, and all the lectures were well attended daily; a vast amount of work being carried out, as shown by the fact that among the seventeen sections over a thousand papers were presented at the meetings.

Too much praise cannot be bestowed on the Organising Committee and the committees formed in nearly every country for the excellence and the completeness as to detail of the sectional arrangements. Everything that could be done was done to make one's way easy, and the matter under discussion was well selected.

The meetings were held in the buildings of the University of London, the Imperial Institute, and the Imperial College of Science and Technology, which afforded excellent and ample accommodation.

The organising work in connection with the different sections was entrusted to officers and committees, and each section made its own arrangements.

The sectional officers consisted of a president, vice-president, a secretary, and one or more assistant secretaries. At the close of each meeting the members elected an acting-president for the next meeting, but the secretaries elected at the first meeting remained in office during the whole session of the Congress.

One great feature of all the sectional meetings was the distribution of most excellent abstracts, chiefly in English, of the papers to be read.

The seventeen sections and sub-sections were as follows :—

- I. Analytical Chemistry.
- II. Inorganic Chemistry and Allied Industries.
- III. (a) Metallurgy and Mining.  
(b) Explosives.
- IV. (a1) Organic Chemistry and Allied Industries.  
(a2) Physiological Chemistry and Pharmacology.  
(b) Colouring matters and their application.
- V. Industry and Chemistry of Sugar.
- VI. (a) Starch Industry.  
(b) Fermentation.
- VII. Agricultural Chemistry.
- VIII. (a) Hygiene and Medicinal Chemistry.  
(b) Pharmaceutical Chemistry.  
(c) Bromatology.
- IX. Photo-chemistry—Photography.
- X. Electro-Chemistry—Physical Chemistry.
- XI. Law, Political Economy, and Legislation affecting Chemical Industry.

At the close of the Congress a General Meeting decided on the date and locality of the eighth International Congress. The American Ambassador (Mr. Whitelaw Reid), on behalf of the American delegates and the country he represented, presented an invitation to hold the next meeting in America in the year 1912. The invitation was received and accepted with great enthusiasm.

During the Congress a number of resolutions were put forward and agreed to, amongst which may be mentioned :—

In the Pharmaceutical Section :—

That an international enquiry shall be instituted with a view to securing : (1) A greater uniformity in the commercial supplies of potent drugs and the means for determining the same, and (2) that common standards of activity should be approximated in the pharmacopœias of the world. It is needless to say much on the importance of such a resolution. As pointed out at the sectional meeting, many medicinal preparations varied in strength, according to the directions of the pharmacopœias of the countries in which they were prepared.

Variations in the strength of leaves, roots, &c., employed were dealt with, and also the fact that different pharmacopœias gave directions for medicinal preparations to be made to contain different proportions of a drug. Uniformity in preparation is therefore greatly to be desired, and would result in benefit both to prescriber and compounder.

In Section XI. the Lord Chief Justice, in his opening address, dealt with the right method of legislating upon and dealing with scientific knowledge, and considered that all countries could approximate to an international code in connection with the proper protection of inventions.

The recent Patents Act in Great Britain was in his opinion a step in the wrong direction as tending to discourage inventors and make people revert to secret processes. At the end of the meeting the following resolution was carried: That the committees of the various countries party to the International Convention for the protection of industrial property be requested to consider the advisability of adopting the following provision: "The manufacture in one country of the union protects the patentee against revocation of his patent in all countries of the union."

At a joint meeting of the Hygiene and Legal Sections, the Congress was requested to appoint a committee to impress on the Governments of each country represented the importance of adopting a uniform law throughout their respective territories regarding the emission of noxious fumes from chemical and metallurgical works, and of black smoke from works and factories. The Sections recorded their opinion that the dispersal of the pall of smoke over many industrial districts in England and elsewhere would be accompanied by benefit both to the inhabitants and to the manufacturers.

In the Section of Bromatology a resolution was carried: "That brandy is a product of the distillation of wine, and the term is synonymous with *eau de vie du vin*."

The subjects under discussion covered so much ground that it is impossible to deal with all the seventeen sections and sub-sections *seriatim*. It will be convenient to limit any review of the work done to sections which were of special interest to sanitarians, and to those which more directly concern the medical department of the Army.

*Hygiene Section (VIII).*—Thirty-six papers were presented and twenty-eight were read and discussed. The most important papers were those dealing with the sterilisation of water, disinfectants and sewage disposal.

These were foreshadowed in the Presidential Address given by Sir James Crichton-Browne at the opening of the Section.

After reviewing the history of sewage disposal, he said that the water-carriage system, although inevitable in this country, was at the best a wasteful and thriftless one. Sir William Crookes had said that individually the amount lost in this way is trifling, but when the loss is multiplied by the number of inhabitants, we have the startling fact that in the United Kingdom we are content to hurry down our drains and water-courses into the sea fixed nitrogen to the amount of no less than £16,000,000 per annum. That was in 1898, and the annual loss must be even greater now. The history of sewage treatment up till a recent date was indeed a series of failures involving an enormous expenditure of public money. He considered the bacteriological system was not an empirical or haphazard experiment but an evolutionary growth, and an imitation of Nature which never fails. It is now certain that the sewage of a great city can be effectually and inoffensively disposed of by anaërobic and aërobic bacteria, and reduced to its original inorganic elements.

He then reviewed the question raised by Dr. Barwise, who recently contended that bacterial beds are not correctly so called, but are, in his view, entomological maneries stocked not only with bacteria but with many varieties of animal life, such as naididæ and tubificidæ, which exist there in enormous numbers, and which effect the destruction of organic matter. There are also numerable polychata, large worms, leeches, larvæ of gnats and flies, and a small black jumping insect called podura, present in such quantities that they can be wheeled away in barrow-loads.

He then referred to Dr. Houston's investigations on the disinfection of water. Dr. Houston had succeeded in exploding the old notion that the improvement effected in water by storage was merely mechanical. It was shown that adequate storage of water reduced the number of bacteria of all sorts, the amount of ammoniated nitrogen present and the amount of oxygen absorbed from permanganate. The outcome of it all was that given a sufficient time a "safety change" took place—the contaminated water disinfected itself. Certain devitalising processes involve the extinction of specific bacteria, and what was really going on was a sedimentation of dead bacteria.

Dr. Houston's final conclusion was that river-water should be stored, antecedent to filtration, preferably for thirty days. Apart from the "time factor," natural disinfection was largely carried out by dilution and changes of temperature.

Sir James Crichton-Browne then described a series of experiments on bacteria to test their vital tolerance of low temperature by means of liquid air. He found that bacteria such as *Bacillus anthracis*, *B. diphtheriæ*, *B. typhosus*, *B. coli communis*, *B. cholerae*, *B. acidi lactici*, and many more were able to survive after being exposed to the temperature of liquid air for prolonged periods up to six months. Ova of salmon and several species of lepidoptera were killed after an exposure of twenty-four hours.

Turning to the subject of disinfectants, he said that there was an enormous trade done in them, with a growing demand, and the public were surely entitled to protection against worthless preparations. This protection was to be found in standardisation best effected by the Rideal-Walker method adopted by the War Office. It was imperative, he thought, that the carbolic co-efficient should be set forth on every bottle or packet sold, and that prompt prosecution should follow any infringement of that rule, prosecution undertaken not by the purchaser but by some public authority as under the Food and Drugs Act. He was almost disposed to suggest a Government official.

M. le Docteur Beunat read an interesting paper on the sterilisation of water by ozone at Nice, in which he described the electrolysis apparatus for producing ozone used at Nice, the action of ozone on water, and its sterilising action. He said that "L'eau ozonée n'a donc pas de propriétés bactéricides; c'est un liquide stérilisé, non stérilisant; son action sur l'organisme ne saurait être celle d'une substance antiseptique."

After giving tables of the results of chemical and bacteriological analysis, he stated that the Otto apparatus worked efficiently at Nice, the production of ozone being regular and constant and the sterilisation of the water giving satisfactory results.

Dr. Thresh thought the process likely to be successful was the use of chlorine or hypochlorites, on which subject he submitted a paper. He stated that with regard to the electrical methods of sterilisation the sight of the complicated appliances necessary for producing the ozone appals the waterworks authorities, and they are, therefore, waiting for some simpler process whereby the objectionable bacteria in water can be eliminated. In a former article in the *Lancet* he showed that when waters were fairly free from suspended matter and organic matter in solution, exceedingly minute quantities of chlorine sufficed for practical sterilisation, and by the subsequent use of bisulphate of sodium the residual chlorine could be easily removed and the water left as palatable as before. One part of chlorine per million, at a cost of not more than 5 shillings per million gallons, with many waters practically sterilised them.

He had made experiments recently to ascertain whether the residual chlorine could not be removed by filtration of some kind, which would also remove any trace of suspended matter, and found that filtration through a thin layer of iron trimmings, or a thicker layer of scrap aluminium, removes the chlorine, and any iron taken up can be removed by a further filtration through polarite.

Dr. Fowler thought that the ozone process appeared to be a very great advance on anything that had been done before, and likely to be preferred, as nothing was added to the water. In the chlorine method, if the water was pure, a very small amount was required, but it was very easy to add too much. The use of chlorine had also more effect on algæ than ozone, which were killed and then decayed in the water. There appeared to be a consensus of opinion that the ozone treatment was excellent in many ways but necessitated electrical power, which must, to be a success, be cheap.

Dr. Klut, of Berlin, reviewed the best methods for the identification and determination of manganese in drinking water. He recommended Volkard's process for testing waters, and for the determination of small quantities in drinking water the colorimetric method of Volkard and Treadvill, and advised oxidation of manganese to permanganic acid with nitric acid and lead peroxide, and comparison of the coloured liquid with nitric acid solutions containing known amounts of permanganate.

On Saturday, May 29th, a joint union of Section VIII. (a) and (b) was held on the important subject of disinfectants, with Professor Armand Gautier in the chair.

Dr. S. B. Schryver and R. Lessing communicated a paper on "Physico-chemical Methods for determining the Antiseptic Value of Disinfectants," of which the following is an abstract :—

"The rate of putrefactive change is measured in the presence of varying quantities of antiseptics by determining the rate of chemical change in the substrate. The latter is not measured directly by chemical methods, but by ascertaining the change in the electrical conductivity. Proteins and carbohydrates, under the influence of putrefaction bacteria, are broken down into simpler substances, which have a higher conductivity (and less resistance) than the original mixture, and the more rapid the putrefaction is the greater is the rate of increase of conductivity. A mixed infection from fæces has been generally employed, and the medium most commonly used has been an aqueous solution of 6 per cent gelatine and 1 to 2 per cent. Witte's peptone. This mixture has been inoculated with fæces and allowed to putrefy till the maximum rate of change is attained, as measured by the conductivity method. This putrefying medium is then used to reinoculate a fresh sterile gelatine peptone mixture in the proportion of 1 cc. of the former to 100 cc. of the latter. Portions of 20 cc. of the infected medium are then mixed with 5 cc. of varying strengths of the antiseptic under investigation, and also with 5 cc. of varying strengths of some disinfectant such as phenol, which can be employed as a standard. A special form of apparatus is employed for making these mixtures. The mixtures of antiseptic and putrefying medium are then incubated, and after a certain interval (three, four, or five days) the electrical resistances are determined with the use of specially devised electrodes. The results obtained can be conveniently plotted on curves, with the strength of solution as the ordinates and the resistances as abscissæ. For a numerical standard the reciprocal of the ratios of the amount of the antiseptic under investigation to that of the standard antiseptic just necessary to entirely stop putrefaction within a given time, is suggested. The influence of the age of cultures, when these are employed for making subinfections, has been investigated, and it has been found that when a subculture is made from a medium at the period of the maximum rate of change, its rate of putrefaction is practically independent of the amount of the putrefying medium used for the inoculation."

A paper by Mr. Wynter-Blyth (in the absence of the author taken as read) on "The Chemical Control of Disinfectants," dealt with the fact that bacteriologists differ very gravely as to their results in testing by the Rideal-Walker method. He said it has further been assumed that a test with naked organisms, such as the Rideal-Walker test, has at least the virtue of unmasking worthless disinfectants. The author, on the contrary, asserted that it may, and does, cover up some of the grossest frauds in the matter of disinfectants, and gave some examples to support his views. He ventured to state that a disinfectant will not be effective in the presence of organic matter unless it contains a high percentage of active material—that is, tar acids. A Privy Council Order of June, 1900, limits the amount of carbolic acid and its homologues to 3 per cent., unless the



disinfectant be labelled as poisonous, He thought the point was, that while bacteriological tests are useful within limits, and are indispensable as a guide to the materials to use for the manufacture of disinfectants, the results have not the mathematical accuracy which is desirable for a standard method under which legal proceedings could be taken. Further, naked organism tests alone may be gravely misleading. On the other hand, chemical analysis, combined with bacteriological tests, appears to be quite adequate to meet all requirements. Practically the only difficulty to be faced was the determination of the composition of emulsions.

The author gives a new method for the analysis of emulsions, and as this is of considerable importance, his method, although somewhat complicated, is here given.

#### THE ACETONE METHOD.

Emulsions, according to their nature, may be de-emulsified by many substances in addition to mineral acids. Thus salt, alcohols, oils, ether, &c., may cause partial or complete de-emulsification; for the purpose of analyses none of these substances are so effective or so convenient as acetone. Resin is soluble in acetone; it is precipitated by water. Petroleum ether dissolves the precipitate. Resin soap in water is precipitated by an excess of acetone and soluble on the addition of more water. Resin soap in petroleum ether may be completely washed out of the ether by a mixture of acetone and water. Albumin and gelatine are soluble in a mixture of acetone and water. Hydrocarbons, phenol, cresylic acid, and higher phenols are soluble in acetone and readily extracted from acetone and water by petroleum ether.

The following method is based on the above facts:—

*Soap Disinfectants.*—Take 200 cc. of a soap disinfectant in a large separating tube, add 200 cc. of pure acetone, then 200 cc. of petroleum ether (boiling below 70° C.): shake with 200 cc. of water, allow to stand, run off acetone-water into 1,000 cc. flask, shake the contents of the tube with 200 cc. of 1 to 1 acetone and water, stand and separate. Repeat this treatment until the washings measure about 800 to 900 cc. Run washings into a separating tube, add 100 cc. of petroleum ether, shake, stand, and separate; add this ether to the ether from the first treatment. Make the washings up to 1,000 cc. exactly, and take 10 to 20 cc. for determination of the amount of emulsifying agent. The alkali-free and combined resin, fatty acids, &c., may be determined in these washings by the ordinary methods. A portion may also be steam-distilled to ascertain if any tar acids or hydrocarbons are still present. This, with the practically neutral disinfectants at present on the market, will not as a rule be necessary.

*Ether Solution.*—Run into a large distilling flask, wash out the separating tubes with ether, and add to contents of the flask. Distil until all the ether and water have come over. This will be indicated by

the thermometer mounting rapidly from 100° C. (I know of no disinfectant containing oils boiling near 100° C.) Pour into a measuring tube, allow for the oil left in the flask (determined by previous experiment), cool, and measure. The result equals total oil and any free resin. Return the oil to the distillation flask, distil, noting the temperatures; in the absence of any quantity of resin the distillation may be carried on until only one or two grammes of residue are left, when coking will occur. Example:—

						Per cent. on disinfectant
Total oil	..	..	{ measured 118 in flask 2 }	120 cc.	..	60
Distilled 180° to 340° C.	..	..	..	117	..	58.5
Residue	..	..	..	3	..	1.5

Now extract the distilled oils three times with an equal volume of pure sodium hydroxide solution, specific gravity 1.2, adding to the oil first one half its volume of petroleum ether. Extract the soda washings once with half its volume of petroleum ether. Mix the two ethers and with the usual precautions distil off the petroleum ether, measure the hydrocarbons.

*The Soda Solution.*—Place in a separating tube; make acid with one part of sulphuric acid in three parts of water, allow to cool, add an equal bulk of petroleum ether, separate, wash the ether and oil well with distilled water. Transfer in the usual way to a distilling flask, distil off the ether and the water; note the amount of oil, if any, coming over with the water. Measure the oil left in the flask. Example:—

Total oil 58.5			By difference				Mean
Hydrocarbons..	23.5	}	24.5	..	25.2	..	24.85
In flask	1.0						
Phenoloids	32.3	}	33.3	..	34.0	..	33.65
In flask	1.0						
			57.8		59.2		58.50

The phenoloids should now be distilled with a good fractionating column, noting the temperatures, the quantities, and taking the specific gravities of the different fractions.

#### WATER.

The difference between the dry emulsifying agent and the total oil represents the water. The results must be checked by distilling off and measuring the water from at least 100 cc. of the disinfectant—the results of direct distillation are always about 1 per cent. too low.

#### ALBUMIN EMULSIONS.

These are not so easy to de-emulsify as are soap emulsions: 200 cc. of the sample are mixed with 200 cc. of acetone and boiled under an inverted condenser until a homogeneous solution is obtained. The liquid is cooled and placed in a separating tube, 200 cc. of petroleum ether are

added. The rest of the process is exactly the same as with soap emulsions.

The following are a few typical results obtained with disinfectants, the composition of which was known:—

	SAMPLE A		SAMPLE B		SAMPLE C	
	Found	Theoretical	Found	Theoretical	Found	Theoretical
	%	%	%	%	%	%
Total oil.. ..	70	70	53	54.0	42	43
Oil distilled .. ..	68	—	52.2	—	41.5	—
Residue .. ..	2	—	0.8	—	0.5	—
Hydrocarbon oils .. ..	30	31	24.2	25.5	2.5	3
Phenoloid oils .. ..	38	40	28.0	28.5	39.0	40
Emulsifying agent .. ..	23	29	34.0	47.0	11.2	11.5
Water (by difference)..	7	—	13.8	—	46.8	45.5
Water direct .. ..	6.3	—	13.0	—	—	—

The following table gives the composition of some commercial disinfectants:—

	No. 4.	No. 5.	No. 6.	No. 7.	No. 5*.
Total oils and resin .. ..	54.5	67.5	62.0	45.0	—
Hydrocarbon oils .. ..	41.5	28.0	2.4	2.5	28.0
Phenoloid oils .. ..	12.5	35.5	48.0	42.0	35.0
Emulsifying agent .. ..	35.0	18.0	7.95	12.3	20.0
Water (by difference) .. ..	10.5	14.5	38.05	42.7	—
Water direct .. ..	9.8	14.0	—	—	9.0

\* These figures were obtained by Spalteholz method.

See also samples No. 1, No. 2, and No. 3 already quoted.

Rideal-Walker figures. Samples No. 1, No. 2, No. 3 and No. A have carbolic acid coefficients of under 4. Samples B, C, D have carbolic coefficients of over 10.

Dr. Rideal and Mr. Orchard read a paper on suggested improvements in disinfectant testing. They considered the suggested modification of the Lister Institute test, which requires the adoption of one definite time of contact for valuation. The majority of disinfectants show increasing carbolic coefficients with longer times of contact, but between two and a half and fifteen minutes lies within the limits of experimental error.

Dr. Croner, of Berlin, read a paper on the disinfectant action of peroxide of hydrogen, and said that it was more active in acid or alkaline than in neutral solution. He concluded that peroxide was not suitable for water disinfection or for sewage, but was very suitable for use as a sterilising agent in surgical practice.

Dr. Thevenaz and H. Cade followed with a paper on "The Standardising of Disinfectants," and the discussion was opened by Professor Kenwood, and replied to by Dr. Rideal.

(To be continued.)

## Reviews.

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**NOTES AND THOUGHTS FROM PRACTICE.** By W. J. Tyson, M.D., F.R.C.P., F.R.C.S. London: John Bale, Sons and Danielsson, Ltd., 1909. Pp. 95. Price 2s. net.

The author of this little work, in writing of the experience and knowledge that must necessarily be possessed by most medical men after many years of practice, and how so seldom this knowledge is transmitted to paper, says, "Perhaps one of the main reasons of this is when a man has gathered much he is too busy to record it, and so it comes to pass that when men have little to do and less experience they write books, and when they should write books they have no time."

It is a pity that some authors do not act up to the spirit of these remarks, but after reading Dr. Tyson's little book we wish he had been able to give us more fully the benefit of his experience.

The author's "Notes and Thoughts" are written in an easy, unpretentious style and treat of quite a variety of subjects, from eye cases to appendicitis.

We like best the clinical studies, such as those entitled "The Danger of Putting Old People to Bed," "On Broad Lines of Treatment," and "Some Thoughts on Food and Exercise."

All abound in shrewd common-sense and keen observation, and contain quite a number of useful "tips" derived from the author's ripe experience.

We have read the little book with interest, and we hope with profit.

O. L. R.

**MESSAGE IN RECENT FRACTURES.** By Sir William H. Bennett, K.C.V.O., F.R.C.S. Fourth Edition, 1909. Longmans, Green, and Co. Demy 8vo. Pp. 144; 23 illustrations. Price 6s.

We welcome a further edition of these lectures, the subject-matter of which has been revised and brought up to present requirements. The method, originally introduced by Lucas Championnière, has, like many another excellent one before it, by a struggle worked itself into practical utility—thanks, in this country, to the author, its first and chief exponent here. Most surgeons have adopted the procedure, if not exactly in conformity with the author's methods, at least with some modification of them. Had stereoscopic views been taken of the fracture shown in Plate I. we are sure they would have more fully exemplified the excellency of the methods advocated by the writer.

With reference to the remarks on pp. 114 and 115 relating to X-rays, we think that in these cases, too, stereoscopic photography properly applied would have prevented the erroneous impression given by the skiagrams—a single skiagram is often confusing, if not misleading. In addition to the above title the book treats on the same procedure in other common surgical injuries, sprains and their consequences, rigidity of the spine and stiff joints generally. The account of stammering spine in Lecture IV. is most interesting and instructive. The chapter on "Rigidity

of the Spine and its Significance" is excellent. The reader will find a very useful and clear summary of the chief points relating to the details of forcible manipulation of joints. C. B. L.

THE LAWS OF WAR ON LAND (Written and Unwritten). By Thomas Erskine Holland, K.C. Oxford: Clarendon Press, 1908.

Professor Holland's little book on the "Laws and Custom of War on Land" is the text-book recommended in the King's Regulations for Subject 3 (iii.) of the examination for Majors of the Royal Army Medical Corps before promotion to the rank of Lieutenant-Colonel.

This book was issued in 1904, and is of course now quite out of date, as a new Geneva Convention and a new Hague Convention have received the signature of the Powers during the period which has elapsed since its publication.

The present work is designed for not only the military profession, but for those "who have occasion to study the branch of International Law with which it treats." The learned author tells us that the evolution of customary rules, designed to lessen the sufferings resulting from warfare, was the earliest achievement of the nascent science of International Law. Those of us who know our Manual of Military Law at all passably are aware that Chapter XIV., originally written by Lord Thring, has been omitted from the 1907 edition as it had become out of date, and owing to the discussion then proceeding at the Hague Conference it was considered desirable to defer rewriting the chapter until the results of the Conference were available. So far as the writer is aware the edition of the Manual with the revised chapter has not yet been published.

Professor Holland's book is, therefore, at present of especial value, as it supplies information on the laws and customs of war lacking from our official guide—the Manual. The distinguished professor has in this book made use of all the official conventions, but as there are many gaps in these quasi-legal enactments he has incorporated them into a code of his own designed to exhibit in a series of continuous articles all the well-established rules of International Law with reference to war on land, whether supported only by the tacit consent of nations, or expressly sanctioned by treaties of general obligation. We may at the outset say that, as might be expected from such an able authority, he has succeeded in producing an excellent *résumé* of the portion of International Law under review.

The book is divided into an introductory chapter, "The Laws of War on Land," divided into eleven sections and three appendices. Sections VI. and parts of Appendices II. and III. are the portions of examinational interest to officers of the Corps.

The section entitled "The Wounded and Sick" is very complete, but, as even Jove nods, the learned author makes a curious slip in paragraph 47. He states that the medical mobile units are described in the British Army as "bearer companies" and "field hospitals," being evidently unaware that there is now but a single medical mobile unit in our army, and it is styled "Field Ambulance."

The Appendices give the full text of the Hague Conventions, the last two Geneva Conventions, the three Hague Declarations, the final act of the Peace Conference, and the Declaration of St. Petersburg.

A comparatively small portion of the book is absolutely essential to the medico-military student, but it may all be read with interest and profit.

It is well printed on good paper, and as it is, practically, the only book containing the last word on the laws and customs of war in relation to the sick and wounded it is a manual which the Major going up for promotion can hardly afford to be without.

R. J. B.

**SEVEREST ANÆMIAS. THEIR INFECTIVE NATURE, DIAGNOSIS, AND TREATMENT.** By William Hunter, M.D. (Vol. i.) London: Macmillan and Co., Limited, 1909. Pp. xv., 226. Price 10s. net.

In the work under notice the author endeavours to differentiate between the several forms of anæmias, about which there has hitherto been much confusion, and in doing so has not spared himself; the amount of labour attaching to the experimental work thereof, as well as that of searching out the bibliography on the subject, must have been very great.

However, Dr. Hunter's conclusions appear convincing, and he has drawn a sharp line between the different anæmias, *i.e.*, progressive pernicious anæmia, Addison's anæmia, and the septic anæmias.

The volume under consideration is controversial to a degree, and its clinical value depends very much on the character of vol. ii., which is in preparation.

F. J. L.

**PARCIMONY IN NUTRITION.** By Sir James Crichton-Browne, M.D., LL.D., F.R.S. London and New York: Funk and Wagnall's Company, 1909. Pp. vi., 111. Price 3s.

This little book of 111 pages is expanded and revised from the author's well-known Presidential Address to the section of Preventive Medicine at the Meeting of the Royal Institute of Public Health at Buxton, in July last.

There is no accounting for taste, and there certainly is no accounting for the extraordinary fads and fallacies with regard to dieting which have occupied the minds and leisure of so many otherwise practical people of the present day. There has been a tendency of late for the tide to flow in the channels of economy in eating, largely encouraged perhaps by the conclusions arrived at by Chittenden as to the value of a lessened protein consumption.

As Sir James Crichton-Browne points out in the opening chapter of "Parcimony in Nutrition," in the last century a redundancy in nutrition was in vogue, but at the present time the fashion and popular craze is all towards a spare diet and a degree of abstemiousness that formerly and rightly would have been regarded as dangerous, if nothing more.

"Parcimony in Nutrition" then, is intended as a criticism of the arguments which support this new departure in dietetics, and the whole presents a clear and excellent *résumé* of the subject. It is written in Sir James's well-known fluent style, and the arguments and criticisms he brings forward are logical and mostly convincing, beside giving food for considerable thought upon a subject which must be of interest to all, irrespective of age or sex.

The chewing theory of Mr. Horace Fletcher comes in for some severe but humorous criticism, and it is well-known that chewing is not essential in the carnivora—for instance, what dog chews his meat? The author passes on to the more important question as to what constitutes the proper daily protein intake to meet the needs of the human body.

In Chapter II. the brilliant researches of Professor Chittenden are not yet considered to have overthrown established opinion on the physiological side of the food question, although a strong case has been made out. Chittenden's views that the daily amount of protein or albuminous food required for the maintenance of bodily vigour is considerably less than that previously laid down by Voit and Attwater, are discussed, and although appealing to the purse, reasons are given to refute some of their value. Although the unanswered argument that Chittenden's lowered protein standard is below that taken by the enormous majority of mankind is rightly pointed out as an initial objection not easily met, still it is not one of overwhelming importance.

The pages devoted to the dietary of the ancient Greeks and Spartans, noted for their culture and endurance, are very interesting and instructive, more especially as it seems they were nourished on a diet into which animal food largely entered, and that they adopted and adhered to one which established a high type of nutrition, but we are not aware of any data on which their daily amount of protein can be calculated.

In Chapter IV. the prison dietary scales of this country previous to 1898, which were so rightly condemned by the present President of the Local Government Board, are given as instances of an insufficient protein dietary.

The No. 1 diet is shown to be just up to Chittenden's standard of protein, and yet was reported upon as inadequate and condemned by the Departmental Committee, while the Class II. dietary, also judged inadequate, was considerably above Chittenden's standard for protein.

The author makes some very sensible and sound remarks with regard to present-day experiments. Those who have performed dietary experiments on various classes of men have recorded these on results *for a time*, and we have yet to learn their subsequent history, and whether a lessened protein consumption may not be sowing the seed of future breakdown. In the author's own words, "There is, I think, a tendency in these experimental days to be a little shortsighted in our physiological views. Immediate results are tabulated, remote consequences are sometimes ignored," and "in appraising the probable effects of a reduced protein intake we must look beyond the individual and consider how it may effect the race."

In the chapter devoted to the study of animal functions, Chittenden's experiments on dogs are thought not to be strictly in accordance with the views of experienced huntsmen and some others.

Chittenden's dogs, although under more healthful conditions than dogs previously experimented upon, were still leading unnatural lives. It is well known to breeders of the bulldog, a type of high-bred animal, noted for its courage and endurance, that even for one weighing only 35 pounds half a pound of meat daily is necessary to keep it in the best condition, in addition to a certain amount of vegetable food. When such a dog is fed mainly on vegetable food it becomes listless, incapable of

sustained exertion, and its coat becomes dull, although the animal may remain plump and up to its normal weight. Sporting dogs likewise, if kept low in protein food during the summer, when again put to work may become sore-footed, go off their food, and frequently break down.

The author points out the useful effects of Chittenden's able researches in certain classes, who habitually eat too largely and especially of proteid food. "There is room for economy in nutrition, but much remains to be said before any wholesale and universal retrenchments in the outlay in food can be recommended," and foreshadows the ill-effects of under-feeding the young.

Sir Crichton-Browne well concludes that the urgent question for us to-day is not how we may teach the poor to thrive on an attenuated fare, but "whence shall we buy bread that these may eat?" and that we should try to "scatter plenty o'er a smiling land."

W. W. O. B.

"HEART DISEASE: GRAPHIC METHODS." By John Hay, M.D., F.R.C.P., and J. Mackenzie, M.D., F.R.C.P. London: Henry Frowde, Hodder and Stoughton. Oxford: Medical Press, 1909. Pp. xvii., 184. Price 7s. 6d. net.

We have read with great interest Dr. John Hay's book on the use of graphic methods in diseases of the heart. This work is a *résumé* of the more modern methods of the investigation of the diseases of the heart and circulation, and brings together in a readable form the large amount of work which has been done on this subject in late years.

The lucid account given of the various instruments and their application, together with the chapter on cardiac anatomy, is very necessary in a book of this nature. We would particularly recommend, on account of its clinical importance, that part of the work dealing with the disturbance of function. As in many works of a similar nature the dissociation of the diagram from the content, although probably unavoidable, is to be regretted.

In conclusion, we recommend this excellent book to the student of higher medicine.

R. H. F.



## Current Literature.

**Proportion of Killed to Wounded in the Russo-Japanese and Franco-German Wars.**—In an interesting and instructive article by Captain F. Culmann, of the French artillery, which has just been concluded in the January number of the *Revue Militaire Générale*, on the losses in Manchuria and previous campaigns, the author gives the following account of the proportion of killed to wounded, and of the influence of the progress of medicine. His figures appear to be taken from *Truppenführung und Heereskunde*. Including the losses of the siege of Port Arthur, the number of men killed or wounded amongst the Germans in 1870 to 1871, and among the Russians and Japanese, 1904 to 1905, was as follows:—

Killed	Russians	..	..	28,800	or	4.9	per cent. of effective strength.			
	Japanese	..	..	47,400	„	8.8	„	„	„	„
	Germans	..	..	17,300	„	2.7	„	„	„	„
Wounded	Russians	..	..	141,800	„	24.0	„	„	„	„
	Japanese	..	..	173,400	„	32.1	„	„	„	„
	Germans	..	..	99,600	„	15.3	„	„	„	„

The proportion of killed to wounded is as follows: Russians, 1 to 4.9; Japanese, 1 to 3.7; Germans, 1 to 5.8; practically, therefore, the Germans had 1 killed for every 6 wounded, the Russians 1 for every 5, and the Japanese 1 for every 4. Captain Culmann explains this difference in the proportion of killed to wounded by the fact that the small-calibre bullets are extremely fatal at short distances, and that, consequently, the Japanese, who were less protected by cover than their adversaries, and were engaged in attack on positions, suffered more from wounds of this nature.

The number of men who subsequently died from wounds is given as follows:—

Russians	..	..	..	..	5,200	or	3.7	per cent. of wounded.		
Japanese	..	..	..	..	11,500	„	6.6	„	„	„
Germans	..	..	..	..	11,000	„	11.0	„	„	„

This decrease in mortality amongst the wounded is attributable, in part at least, to the effects of firearms of small calibre. The progress of medicine and surgery is indicated by the results obtained in the treatment of sick and wounded.

As regards the sick the following numbers are given of those who were admitted into the field hospitals:—

Russians	..	..	..	..	358,400	or	51.3	per cent. of strength.		
Japanese	..	..	..	..	334,100	„	51.4	„	„	„
Germans	..	..	..	..	480,000	„	59.4	„	„	„

The health of the troops was consequently somewhat better in 1904-1905 than in 1870-1871, yet in both campaigns the armies suffered equally from epidemic diseases. Thus there were 73,400 cases of enteric fever amongst the Germans, and more than 30,000 amongst the Russians, while the Japanese suffered very severely from beri-beri. There were 38,600 cases of dysentery amongst the Germans, and 30,000 in round

numbers amongst the Russians. The losses amongst the Japanese from beri-beri are attributed, in part, to the fact that at the beginning of the campaign they were in the habit of cooking their rice several days in advance, and heating it when it had to be eaten. It was ascertained that there were toxins in the cold cooked rice. Amongst the Russians, on the other hand, kitchens on wheels offered very great advantages.

The number of men who died from disease was extremely small on the side of the Russians as compared with the Japanese and Germans, as is shown by the following figures:—

Russians	..	..	9,300	or 2.6 per cent. of admissions, or 1.3 per cent. of strength.
Japanese	..	..	27,200	„ 8.1 „ „ 4.2 „ „
Germans	..	..	14,900	„ 3.1 „ „ 1.8 „ „

As regards the wounded the figures also show more favourable results on the side of the Russians than amongst the Japanese or Germans. The figures already given show this to some extent. Put in another way, it amounts to this, that the Russians had only 1 death amongst 27 wounded, while the Japanese had 1 amongst 15, and the Germans 1 amongst 9. The Russians, too, had only 1 death from disease to 3.6 from wounds, the Japanese 1 to 2.2, and the Germans 1 to 1.9, thus showing much more favourable conditions as regards disease amongst the Russians than amongst either the Germans or Japanese. W. G. M.

**New Field Medical Organisation of the French Army.**—The new organisation recommended by the committee presided over by General de Lacroix has made a radical change in the field medical organisation of the French Army. The different varieties of ambulances and the field hospitals have disappeared and in their place a number of uniformly equipped and organised ambulances has been created. Each army corps will have sixteen of these ambulances, of which four will be held in reserve on the lines of communication. These reserve ambulances are exactly similar to the others, but are without transport, transport for them being provided only as required. The transport of each of the other ambulances consists of seven two-horsed wagons, carrying amongst other material 2,000 prepared dressings, 50 stretchers and two tortoise tents. With each ambulance a hospital section is mobilised, consisting of three wagons of reserve material for use in case the ambulance becomes temporarily immobilised and has to act as a hospital. When an ambulance is thus immobilised its transport material becomes available for one of the ambulances in reserve. The stretcher-bearer sections are to be under the command of medical officers and each section is to be provided with a medical cart. In addition a sanitary section (*section d'hygiène et de prophylaxie*) for hygienic investigations, disinfection, &c., is attached to the army corps section of stretcher-bearers.

Several other changes affecting administration, supply of medical and surgical material, and line of communication units are proposed. The clearing hospital remains as an essential feature in the organisation, but it has been relieved of the duty of acting as an advanced dépôt of medical and surgical stores, this duty being now transferred to the hospital sections of the ambulances.

The new edition of the field service regulations of the French Medical Service has not given effect to these changes, but this edition is regarded

only as provisional. At present these outlines of the new organisation have been referred to in the public press only. W. G. M.

**The Red Cross in the Far East.** (*Bulletin No. 2 of the Red Cross Society of Japan*. Tokyo, November 8th, 1908.)—The Report of the Japanese Red Cross Society, which has just been issued in English, is interesting reading. It gives a concise and clear account of the organisation and work of the society, including the complete text of its regulations for relief service in time of war and of calamities. The former regulations are in fourteen chapters and ninety-three articles, the latter in three chapters and twelve articles. They embody clear practical instructions for the organisation and use of voluntary aid and for its work in war as an auxiliary to the medical services of the army and navy. The bulletin contains several short notes on relief work in Formosa, ambulance service in Tokyo, honours and rewards, description of local Red Cross Hospitals, and Baron Ozawa's impressions of the International Conference of Red Cross Societies in London in 1907. There is an interesting table of the distribution of membership in the empire, and an instructive chart showing the organisation of the society. The society has ready for war in organised detachments 4 directors, 237 physicians, 141 apothecaries, 84 clerks, 5 assistant apothecaries, 262 chief female nurses, 89 chief male nurses, 3 chief stretcher-bearers, 2,323 female nurses, 572 male nurses, and 131 stretcher-bearers. The relief detachments, as they are called, are formed of 2 medical officers, an apothecary, a clerk, 2 chief nurses and 20 nurses, and are intended for taking over the charge of 100 patients in military hospitals. They are mobilised by order of the Minister of War or of the Navy, and carry out such work as is entrusted to them by the military or naval authorities. The stretcher-bearers are organised into a transport column capable of transporting 30 patients; the composition of the column being 1 director, 1 medical officer, 1 clerk, 2 chief male nurses, 3 male nurses or sick attendants, 3 chief stretcher-bearers and 120 stretcher-bearers.

The total membership of the society is 1,397,344, or 1 in every 38 of the population of Japan. This proportion is very evenly maintained throughout all the provinces of the empire.

The Japanese Red Cross Society may justly be regarded as the model of what a Red Cross Society should be, in that it is ready without confusion and in the simplest possible manner to take over the ward duties of the regular medical service in all the large garrison hospitals of the country, and thus set it free for duty with the field army. Its organisation and work have been evolved out of the practical experience of three wars. W. G. M.

**Courses of Instruction for Medical Officers, Pharmacists, and Quartermasters of the Reserve in their Duties on Mobilisation.**—An instruction of February 10th, 1909, has been issued by the Army Medical Department of the French War Office on the organisation of courses of instruction for the reserve and territorial medical, pharmacist, and quartermaster officers.

The courses will take place annually at six centres, viz., Paris, Rennes, Limoges, Montauban, Lyon, and Camp de Châlons in two series, the first

from May 1st to 22nd for the reserve officers who will be attached to ambulances and field hospitals on mobilisation, and the second from May 14th to May 22nd for territorial officers and pharmacist officers of the reserve, who will be attached to field hospitals, clearing hospitals, and ambulance trains on mobilisation.

The courses will consist of practical lectures and field exercises. The former will be general, for all officers, in field regulations and the nature of field medical units, and special for each class of officer in his particular duties. The latter will take place after the lectures, and will be combined with the exercises of the regular medical service and garrison manœuvres specially arranged for the purpose of the course. The different elements in the field medical service will be organised during these exercises, namely, aid posts, ambulances, field hospitals, and clearing hospitals.

The general officer commanding the *Corps d'armée* at the centre will determine the officers and men who are to be placed at the disposal of the medical service for these exercises, and will appoint an officer of general rank as director of the manœuvres.

The medical officers taking part will consist of a surgeon-colonel, and surgeon-lieutenant-colonel, appointed by the Minister for War, and the following establishment of officers for medical units :—

				Surg.-Major	Surg.-Capt.	Surg.-Lieut.
Divisional Ambulance .. ..	..	..	..	1	2	4
Corps Ambulance (1 section only) ..	..	..	..	1	1	2
Field Hospital .. ..	..	..	..	1	1	1
Clearing Hospital .. ..	..	..	..	1	1	2

A pharmacist is appointed to the field hospital and clearing hospital, three quartermasters to the divisional ambulance, and two to each of the other units.

The rank and file of the medical units will be obtained from the sections of *infirmiers* on the active list. The regimental medical service will be that serving with the regiments at the time.

The material used will be the vehicles and material of each unit, in accordance with war establishments.

All the reserve and territorial medical officers, pharmacists, and quartermasters will receive notification of the details of the courses, and will be at liberty to attend.

These new instructions take the place of the instructions of June 30th, 1902, regarding military medical manœuvres, the chief change being in the time of the year and in the organisation of two series of lectures, in addition to the manœuvres.

The programme of the course is detailed to embrace the following :—

#### (A) LECTURES.

(To be given by the surgeon-colonel appointed as technical director, and the surgeon-lieutenant-colonel appointed to assist him.)

#### First Series.

(1) General lectures on mobilisation, mobilisation orders, place of mobilisation, steps to be taken by medical officers when mobilisation is ordered, and on arrival at destination. Reading of maps, and study of

maps to scale  $\frac{1}{100,000}$ . General organisation of an army, and general notions on the combat. The general work of the medical service in the field. Field rations and requisitions. Deaths, burials, and hygiene of the battle-field.

(2) Lectures and demonstrations on the field ambulance. The different kinds of ambulance and its material. The method of mobilising it. Billeting and bivouac of an ambulance. Its functions when troops are stationary, on the march, during battle, and after battle. Clearing the ambulance. Steps to be taken when an ambulance is in risk of capture, (duties and rights of the *personnel*). Replenishing stores.

(3) Lectures on field hospitals. The composition and material, method of mobilising, billets and bivouacs, duties in the field, and on line of communication, (*i.e.*, when temporarily immobilised or established for some special object such as an isolation hospital). Clearing the field hospital. Duties and rights when captured by the enemy. Replenishing stores.

#### *Second Series.*

(1) Lectures similar to (1) of First Series.

(2) Lectures on field hospitals, similar to (3) of First Series.

(3) Lectures on clearing hospitals. Composition and material. Mobilisation. Evacuation duties. Convoys by road with road rest stations. Convoys by water with port rest stations. Convoys by rail, ambulance trains, and railway rest stations.

#### (B) MANŒUVRES.

These are carried out in accordance with the Field Service Regulations, the programme being arranged by the general officer appointed director of the manœuvres in consultation with the technical director. The general officer commanding the Army Corps at the centre where the course is held will submit the programme to the Army Medical Department at the War Office one month before the date fixed for the manœuvres.

The instructions contain, in addition to the above, details regarding allowances, horses, orderlies, reports, and expenses of the manœuvres.

W. G. M.



## Correspondence.

### CO-EXISTENCE OF ENTERIC FEVER AND MALARIA IN THE SAME PATIENT.

TO THE EDITOR OF THE "JOURNAL OF THE ROYAL ARMY MEDICAL CORPS."

SIR,—Your issue of May, 1909, contains a letter on the above subject from Captain Sewell, in which he summarily disposes of my poor "claim" without apparently having realised what that claim was. If Captain Sewell will refer to my note again he will find that I was careful to exclude such cases as those he quotes where the point was merely to determine the co-existence of the two diseases.

My note referred to the demonstration of the simultaneous presence in the blood of the causal agents of two different diseases. In preferring my "claim," I was perhaps not clear enough in insisting on the presence of these agents in the blood, but perusal of the context will show that this was the essence of the communication, a point which seems to have escaped Captain Sewell's observation.

I am, &c.,

*Quetta,*  
*June 9th, 1909.*

A. B. SMALLMAN,  
*Captain, R.A.M.C.*

### DISPOSAL OF PATIENTS SUFFERING FROM MALARIA.

TO THE EDITOR OF THE "JOURNAL OF THE ROYAL ARMY MEDICAL CORPS."

SIR,—I would like to have an expression of opinion by my brother officers who have had Indian experience, on the following point:—

Should men who have had malaria of the malignant tertian type, complicated with enlarged and tender liver and spleen, extreme anæmia, albuminuria, dyspnœa, basic bruit, and œdema of the feet and legs, be sent to the Hills during the winter months instead of being invalided to England?

All the officers whose opinions I have asked expressed themselves very strongly on the matter. They say, "It would be nothing short of manslaughter" to send such cases to the Hills.

I concur in this opinion, but I make no comment.

I am, &c.,

*Naini Tal,*  
*June, 1909.*

L. E. ANDERSON,  
*Colonel.*

**MEDICAL INSPECTION ROOMS: A PLEA FOR A SUITABLE  
RECORD BOOK.**

TO THE EDITOR OF THE "JOURNAL OF THE ROYAL ARMY MEDICAL CORPS."

SIR, — The record proposed by Serjeant H. Ladwick in the May Journal is one that I adopted for some years before I ceased to be actively employed; but my record was simpler and quite a private one, kept by myself for my own information, and it entailed very little trouble.

In my book the names of the men were arranged (the book being so paged off) alphabetically—very necessary—with dates, diseases, and disposal, and nothing else beyond certain arbitrary numbers (1 to 10), indicating the degrees of importance I attached to the cases at the time. Other information, such as age, &c., was supplied in the sick reports of the morning, or previous sick reports of the dates in my book. I kept all my old sick reports fastened together in bundles, by months—very easily accessible—and on these I would generally find notes which I was in the habit of making on each case. It was seldom I had to refer to these reports; but there they were, with brief, abbreviated and pertinent remarks on the back of them, if needs be, as well as on the front. Thus in a very few minutes, when necessary, I had at my command a good deal of useful information, extending over the past year or two. The possession of this information was enough to get me credited with a much better memory than I ever possessed.

I am, &c.,

J. P. H. BOILEAU, M.A., M.D.,

*Trowbridge.*

*Lieutenant-Colonel, A.M.S. (Retired).*

Journal  
of the  
Royal Army Medical Corps.

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Original Communications.

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THE PREVENTION OF ENTERIC FEVER IN INDIA.

BY LIEUTENANT-COLONEL A. R. ALDRIDGE.  
*Royal Army Medical Corps.*

ATTENTION having recently been drawn in the Journal to the modern methods of combating enteric fever, and especially to the importance now attached to the "carrier," and the rules in force in the French Army having been quoted, it may interest those elsewhere to learn what is actually being done in India on these lines.

To quote from the Standing Orders for the Military Medical Services:—

"Suspected cases will be isolated in an observation ward; diagnosed cases will be treated in a special ward; convalescents will be kept in a separate ward. All will be dealt with as infectious cases.

"All men living in the same tent, or section of a barrack-room, from which a case has been admitted, will, whenever practicable, be segregated and inspected frequently for one month to detect as early as possible any fresh cases.

"Hospital bedding, clothing, and equipment will always be disinfected after use. That specially marked for use in infective cases will be used.

"Bowel discharges and urine, sputa and swabs will be received in vessels containing a solution of a reliable disinfectant in sufficient strength. The water used for washing the sick will be disinfected by boiling or by adding to it quick-lime, chlorinated lime or cresol to make a solution of 2 per cent., and allowing the mixture to



stand for an hour. Fragments of food and sweepings from wards will be burned.

"Excreta will be disinfected by boiling, or if, for special reasons, chemicals are used, by cresol or 1 in 200 acidulated mercuric chloride solution, an equal volume to that of the excreta being thoroughly mixed with the dejecta and left for ten minutes.

"Food must not be left exposed in the wards; and sweepers must not be allowed to take away for their own use any fragments or remains.

"Wards in which enteric fever cases have been treated should be disinfected before being used for other cases; and in every case once a year.

"The following precautions will always be observed in connection with orderlies nursing enteric fever cases :—

"(a) It is most desirable that those not protected by a previous attack of the disease should be inoculated, and the operation should be repeated when one year has elapsed since the previous inoculation.

"(b) In selecting men for such employment preference should be given to those whose age and service in India make them less liable to infection.

"(c) Men employed in nursing enteric fever cases should not be allowed at the same time to attend other cases.

"(d) All washable articles of clothing worn by them in the wards will be disinfected before being washed. Cloth clothes should be used as little as possible and only under the special clothing.

"(e) Nursing orderlies must be instructed as to the necessity and in the method of thoroughly disinfecting their hands, &c., before going off duty. Effectual means for this must be provided and supervision exercised to ensure that it is carried out.

"Ward servants and, as far as possible, sweepers employed in connection with enteric fever cases should not be allowed at the same time to do work for other cases.

"Convalescents from enteric fever will be isolated until there is reason to believe that they are no longer capable of spreading infection. Their fæces and urine should, whenever possible, be subjected to repeated bacteriological examination, as the discharge of typhoid bacilli is markedly intermittent.

"When it is proposed to transfer convalescents to other stations the officers commanding the hospitals concerned will communicate directly with each other to enable every necessary precaution to be taken.

"The barrack-bedding of enteric fever patients and of the beds on each side of them in barracks and all of their clothing which may in any way have become infected, will be taken to hospital and disinfected. The bed-cots of these men and the portions of the barrack-room occupied by them will also be disinfected.

"The pans and seats of the barrack latrine and urinary used by an enteric fever patient will be disinfected.

"In order to prevent the employment on any duties entailing the handling of food of any persons who may be harbouring and excreting typhoid bacilli the following precautions will be taken:—

"All men, British and native, whose duties entail the handling of food intended for British troops in kitchens, officers' and non-commissioned officers' messes, regimental and other institutes and clubs, Government and regimental dairies, bakeries, mineral-water factories, &c., should be examined from time to time by a medical officer. During the enteric fever seasons these examinations should be made at short intervals. The medical examination will be so directed as to detect those who have suffered from the disease either in a form recognised as such, or so slightly as to escape recognition and those who have been in close contact with persons suffering from the disease.

"In certain cases the Widal test may be of assistance in forming an opinion, and those whose blood gives a positive reaction are to be considered unfit for such employment unless proved free from the bacillus, or the reaction is accounted for by inoculation.

"No man who has recently suffered from enteric fever should be so employed until it has been placed beyond all doubt by repeated bacteriological examinations of fæces and urine that he no longer harbours the *Bacillus typhosus*. In cases where means for carrying out such examinations are not available these men must not be employed."

It is unnecessary to dwell on the precautions taken in connection with water supplies, because there is no novelty in them and because there is ample evidence that at present water supplies of cantonments are seldom concerned in the spread of enteric fever in India. In camps and on the march water is undoubtedly a more frequent source of infection, and it must be admitted that we have not yet any very efficient apparatus or system of safeguarding the supply. A solution of the question is being sought in several directions.

Milk supplies have been much improved in many stations by the institution of Government dairies, of which there are now

twenty-four. Bazaar sources of supply are still a very probable source of infection, though the small quantity of milk drunk by soldiers makes it unlikely to be a frequent source of infection.

Flies are excluded from hospital kitchens and wards and from barrack kitchens by means of wire-gauze doors and windows, and in some stations from officers' quarters also. The cleanliness and internal economy of kitchens have been much improved to prevent the contamination of food.

In place of the dry earth previously used in latrines a mixture of cresol emulsion and water is used in the pans. This is found to keep flies away and produces disinfection of the superficial portions of the excreta. Besides thus preventing infection being directly carried by flies it also prevents their eggs being laid in the excreta and so lessens the number bred in the filth trenches.

In a good many barracks latrine seats have been provided with self-closing lids and wire gauze doors at the back so as to make them fly-proof.

Endeavours are being made to lessen the accumulations of refuse and stable litter and so diminish the breeding of flies. In a number of stations incinerators have been installed to burn these. The breeding of flies in filth trenches is receiving attention; deeper trenches are being made and the trenching grounds are being removed farther from barracks.

Special attention has been directed during the past year to the possibility of the direct contamination of food by "chronic typhoid carriers." In suspicious cases the blood has been tested for agglutinins, and in a number of cases the stools and urine have been examined for the *B. typhosus*. In a few cases the blood was found to give the Widal reaction, but this merely raises a suspicion that the individual (if he has not been inoculated) has had enteric fever and is no evidence that he is a "carrier." In one case a soldier-cook who had enteric fever in 1896 was found to be intermittently excreting typhoid bacilli in his urine, but no case of enteric fever occurred in his company while he was so employed.

The scattered distribution of the cases among almost all barrack-rooms and all troops and companies of regiments, and the marked seasonal prevalence of the disease, are striking characteristics of most epidemics, and are difficult to reconcile with the supposition that the infection of food by "chronic carriers" is a frequent source of epidemics in India; so also is the occurrence of similar epidemics in native regiments in which each man cooks for himself.

The combined observations of a large number of investigators

in various countries show that about 3 per cent. of convalescents become "chronic carriers," and a large proportion of these—80 per cent. according to one observer—are women. Now, there are some 1,000 cases of enteric fever in the British Army in India yearly, of which about 200 die and 100 are invalided to England; so of the remaining 700 we may assume there will be twenty-one "chronic carriers." But not more than 3 or 4 per cent. of soldiers are employed in connection with food, so only one or two such men can be accounted for yearly in the whole army, and it is difficult to believe that the proportion among natives employed in a similar way is very much greater.

On the other hand, all these "carriers" must be looked upon as sources of indirect infection; but in this respect their numbers can be only insignificant compared with those of unrecognised cases and of all recognised cases before admission to hospital. An examination of 200 temperature charts showed that the fever had commenced on an average three days before the men were admitted to hospital, and probably there were more cases, as in many of the records the dates of attack and of admission are taken as the same. Of seventeen cases which occurred in an outbreak at Lucknow, and in which the dates of attack were carefully enquired into by the Divisional Sanitary Officer, the average number of days the men remained out of hospital was 5·7; the minimum being two and the maximum twelve. Many reports show that not infrequently men remained out of hospital for seven or eight days, and in some cases ten to fourteen days. For each "chronic carrier" there must thus be from forty to fifty such men equally dangerous for shorter periods.

The incidence of cases by small groups from the same barrack-room at intervals corresponding closely with the incubation period of the disease, which has often been pointed out and tabulated (Army Medical Department report for 1906), supports the view that such men are among the most frequent sources of infection; and emphasises the importance of stricter endeavours to isolate men at the earliest possible stage of the disease.

Conradi<sup>1</sup> has recently again drawn attention to the fact, already well known, that the bacilli are discharged in the stools during the incubation period and earliest stages of the disease. He believes that the disease is particularly infectious during the early stages, and of twenty cases investigated by him he considered that twelve

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<sup>1</sup> *Klin. Jahrb.*, vol. xvii., fasc. 2.

TYPHOID CARRIERS, 1908.

Serial number	Rank	Name	Corps	Station	Date of			Fæces	Urine	How disposed of
					Attack	Cessation of fever	Positive result			
1	Private ..	H.	1st Bedfordshire Regiment	Naini Tal ..	17.5.07 at Jhansi	13.7.07	27.4.08 5.5.08 25.11.08	+	+	Invalidated to England, 28.11.08.
2	" ..	L.	1st Bedfordshire Regiment	" ..	21.4.07 at Jhansi	13.7.07	18.7.08 19.7.08 25.11.08	+	-	Invalidated to England, 28.11.08.
3	Gunner ..	C.	Ammunition Column	" ..	12.3.08 at Meerut	30.3.08	Examined 13 times	Bacilli recovered 11 times	Examined 9 times; with negative result	Invalidated to England, 28.11.08.
4	Bombardier	S.	77th Battery, R.F.A.	" ..	13.5.08 at Fyzabad	15.6.08	1.9.08 31.12.08 3-9-08 to 19-9-08 18.11.08 to 5.12.08	+	-	Invalidated to England, 1.1.09.
5	Private ..	O.	The Cameron- ians	" ..	9.5.08 at Cawnpore	27.5.08	21.12.08 20.11.08	-	+	Invalidated to England, 1.1.09.
6	" ..	P.	2nd N. Stafford- shire Regiment	" ..	11.5.08	22.6.08	26.11.08 ..	+	-	Invalidated to England.

7	Private ..	S.	2nd Royal Fusiliers	Secunderabad	8.12.07	26.2.08	1.6.08 8.6.08 8.7.08 12.7.08 19.10.08 7.12.08 15.12.08 8.2.09 13.2.09 16.2.09 17.12.08 29.1.09 30.1.09 10.11.08 13.11.08 11.2.09 14.2.09 24.11.08 5.12.08 13.12.08 23.12.08 31.12.08 3.1.09 15.1.09 19.1.09 20.1.09 26.1.09 7.7.08 14.7.08 20.7.08 3 months' convalescent	+	+	-	-	Invalidated to England.
8	"	S.	2nd Royal Fusiliers	Wellington ..	4.6.07	12.9.07		-	-	+	+	Sent to England as a sick transfer to join Army Reserve.
9	"	U.*	2nd Royal Fusiliers	Secunderabad	..	..		-	-	+	+	..
10	Mrs.	N.	1st Manchester	"	19.9.08	20.11.08		-	-	+	+	Proceeded to Kemptee to join her husband's regiment.
11	Private ..	S.	1st Sherwood Foresters	Bangalore ..	..	1896		-	-	+	+	Removed from duties as cook.
12	Mrs.	L.	D Battery R.F.A.	Mhow ..	1908	..		-	-	+	+	Remains with corps. Advised to take precautions.

\* Nursing Orderly. Before return to duty he was examined according to the procedure in force, and found to be harbouring the *B. typhosus*. He was kept on duty at the hospital; but since his first examination the result has been negative. Employed as cook.

contracted the disease from other cases during the first week, six during the second, and only two at later stages.

Knowledge of the epidemiology of enteric fever is still far from the stage at which we can concentrate our efforts at prevention on one channel only. The only safe policy is to safeguard all possible sources.

Paratyphoid bacilli were, during 1908, isolated from the blood of four cases; three of these were paratyphoid  $\alpha$ . In addition six cases were diagnosed paratyphoid  $\alpha$ , two paratyphoid  $\beta$ , and one "paratyphoid," on the results of agglutination reactions; but this is recognised as being insufficient evidence for a certain diagnosis.

With a view to isolating convalescents more completely than can be done in most stations, and at the same time providing opportunities for detecting "chronic carriers" with as much certainty as possible, convalescents from the 3rd, 5th, 7th, and 8th Divisions were sent to Naini Tal. The depôt is about a mile from the civil station and no other troops were stationed there. The Divisional laboratory is at Naini Tal and a special officer, Captain D. Harvey, was detailed to carry out the bacteriological work. A steam disinfecter for clothing and means for boiling all excreta before disposal were provided. The depôt was opened on April 8th, and during the remainder of the year 310 convalescents were received—that is, excluding those invalided to England, more than one-third of the convalescents from all India.

The urine and fæces of each man (unless already found to be a "carrier") were examined for about seven consecutive days, and none were sent back to their stations until at least four months had elapsed since the cessation of fever. It was found that the great majority of convalescents cease to pass bacilli in their urine within a few weeks of convalescence; only one man was found still passing them by this channel. Of 190 men whose excreta were examined, six were found to be still excreting bacilli (five in the fæces and one in the urine) more than six months after cessation of fever; that is 3·1 per cent. of the convalescents. These men were all invalided to England and were still excreting the bacilli, eighteen, sixteen, twelve, eight, and six months after cessation of fever. During the year 1,472 examinations of fæces and 1,448 of urine were made.

As regards the effect of this measure on the incidence of enteric fever at the stations from which the convalescents came, it is found that the admissions for enteric fever from all the stations which sent convalescents to Naini Tal show a reduction of 9 per cent.

on the figures for 1907, while the remaining stations show an increase of 26·6 per cent.

As a result of this trial a similar convalescent depôt for Southern India has been established at Wellington.

At stations from which convalescents could not be sent to Naini Tal they were isolated as strictly as practicable locally, and where laboratories were available their excreta were similarly examined. Five "chronic carriers," two of whom were women, were discovered, also a nursing orderly, who was a "temporary carrier." Of the men one was invalided to England and one proceeded home time expired.

The table on pages 226 and 227 shows all the "carriers" that have been discovered during the year.

Early diagnosis, a most important factor in prevention, has been much facilitated by the adoption of blood cultures to isolate the bacillus. This method has been carried out in 372 cases, of which 119, or 32 per cent., were positive.

The means taken to detect "carriers" among persons handling food have already been mentioned.

In addition to those made at Naini Tal 269 examinations of the fæces and 591 examinations of the urine of convalescents and healthy persons were made at other stations.

Anti-typhoid inoculation has been carried out extensively during the last two years. No figures are available to show the average number of inoculated men present during 1908, but the following statement shows the numbers present on January 31, 1909. From this it may be assumed that the number of inoculated men was approximately one third of the total, or half as many as the non-inoculated, omitting those protected by a previous attack of enteric fever.

During 1908 there were 825 cases of enteric fever and 164 deaths among non-inoculated men, and 173 cases and 24 deaths among inoculated. These results correspond very closely with those previously obtained in India.<sup>1</sup> Speaking generally, it may be said that the attack-rate in inoculated men is reduced to rather less than one half, and the case mortality to about two-thirds, of the rates in uninoculated men.

Of the cases in inoculated men two were admitted to hospital within seven days of their first inoculation, and so probably had acquired the infection before inoculation; five others were admitted

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<sup>1</sup> Army Medical Department Report, 1907, pp. 103 and 104.



**CENSUS OF WARRANT AND NON-COMMISSIONED OFFICERS AND MEN, BRITISH SERVICE, INOCULATED AGAINST ENTERIC FEVER,  
TAKEN ON THE LAST DAY OF JANUARY, 1909.  
*India Command.***

(1)	(2)																Total	Number inocu- lated two or more times
	NUMBER OF INOCULATED MEN WHO HAVE NOT HAD ENTERIC FEVER																	
	Last inoculation in																	
	1896 to 1898	1899 to 1900	1893	1897	1898	1899	1900	1901	1902	1903	1904	1905	1906	1907	1908	1909		
2,900	1	65	1	—	14	206	49	85	37	3	33	244	1,818	10,046	10,493	901	23,996	16,000

within thirty days of inoculation, and may have been infected before inoculation. None of these cases were fatal.

The following table shows the intervals between inoculation and attack as well as the influence of one and two doses of vaccine :—

	1 year		2 years		3 years		4 years		5 years		Over 5 years	
	Admissions	Deaths	Admissions	Deaths	Admissions	Deaths	Admissions	Deaths	Admissions	Deaths	Admissions	Deaths
Received 1 dose only, within	26	2	14	1	1	..	2	1	..	..	4	1
Received 2 or more doses, within	52*	8	47	4	..	..	1	1	..	..	1	..
Number of doses uncertain, received within	8	1	8	1	1	1	..	..	1	1	7	2
Totals .. ..	86	11	69	6	2	1	3	2	1	1	12	3

\* In three cases the last dose only was received within one year, the previous doses having been received earlier.

The next table shows the case mortality, duration of fever, and the incidence of certain complications in inoculated and non-inoculated men :—

	Case Mortality %	Duration of Fever in days	Percentage		
			Intestinal hæmorrhage	Perforation	Thrombosis
Uninoculated	19·88	23·97	15·52	4·73	3·03
Inoculated	13·87	21·70	10·40	2·90	2·90

As regards the result of the measures for combating enteric fever which have been in force during recent years, the following table shows that there has been a steady fall in the number of cases and of deaths.

A familiarity with the subject of enteric fever for a series of years convinces one that the surest test of its prevalence is the death-rate. The very mild cases are so difficult of diagnosis in a country where many other fevers are prevalent that it is somewhat a matter of fashion how many of these are diagnosed as enteric fever. No doubt bacteriological aids to diagnosis, which

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are becoming better understood and more generally used, tend to include more of the slight cases. This is indicated in the diminishing case mortality, and is of great importance in lessening the foci of infection.

It is of interest to notice that with the decrease of enteric fever there has been a simultaneous decrease of dysentery, which tends to confirm the opinion that this group of diseases is propagated by similar agencies to those responsible for the spread of enteric fever.

Years	Enteric Fever			Dysentery	
	Ratio per 1,000		Case Mortality	Ratio per 1,000	
	Admissions	Deaths		Admissions	Deaths
1898	36.3	10.00	27.7	29.8	0.78
1899	20.6	5.14	25.0	25.4	0.65
1900	16.0	4.77	29.8	25.8	0.86
1901 <sup>1</sup>	12.8	3.32	26.0	21.3	0.97
1902	16.7	4.29	25.7	20.4	0.69
1903	19.6	4.18	21.4	16.9	0.70
1904	19.7	3.76	19.1	12.6	0.42
1905	16.1	3.00	18.6	13.4	0.46
1906	15.6	3.19	20.5	15.2	0.53
1907	13.1	2.77	21.1	11.7	0.33
1908	14.6	2.74	18.8	14.4	0.42

<sup>1</sup> During the trooping seasons 1899-1900 and 1900-1901 only about one third of the normal number of men arrived in drafts from home.

## MODERN OPERATIONS FOR VARICOSE VEINS.<sup>1</sup>

By H. W. M. GRAY, M.B., F.R.C.S.ED.,

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IN the great majority of cases the potentiality for varix formation has existed from birth. The ordinary varicose vein is an example of true hypertrophy, shown not only in the circumference and thickness of the vein wall, but also in the length of the vein. The vein frequently assumes a very tortuous course in order that the increase in its length may be accommodated. This hypertrophy manifests itself soon after puberty. At first no subjective symptoms are noticeable. Sooner or later the valves become incompetent because they do not share equally in the hypertrophy which affects the rest of the vein. Thereafter the patient suffers, to a usually slowly increasing extent, from the complications of varicose veins, such as aching, easily tired limbs, pruritis, dermatitis, ulcer, phlebitis, and so on.

All these symptoms are due to venous stasis and back pressure, either directly or indirectly. This is proved by the fact that when such stasis and back pressure are prevented by postural treatment, the complicating symptoms vanish. It is readily understood that anything which mechanically causes obstruction to the venous return, such as pregnancy, tumour, &c., will aid the *development* of varicose veins.

Herein lies the guide to efficient operative treatment! One should ascertain, however, how much must be done in order to make certain that the various channels through which this back pressure occurs will be obliterated. One must also find out in certain cases with a history of deep phlebitis whether any operation on the superficial veins be permissible at all.

Various tests will show that the back pressure, evidenced in the superficial veins, is due to (a) inefficient valves, and (b) communication with the deep veins.

(1) Make the patient lie down and elevate the affected limb. The veins empty. Place a finger over the upper end of the internal saphenous vein to compress it, and make the patient stand up. The veins are found to be collapsed. Now remove the compressing

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<sup>1</sup> Reprinted from the *Medical Magazine* for May, 1909.

finger and the blood rushes backwards down the vein and distends all the varicose parts.

(2) Patient recumbent as before. Elevate the limb, put a finger on the saphenous, and make the patient stand up. Keep the finger in position, occluding the saphenous. The superficial veins in the limb, which are empty at first, are seen to fill up slowly till they are nearly as full of blood as at the end of test (1).

(3) The patient stands. Place a finger on saphenous vein as before. Then bring the "muscular pump" of the limb into action by making the patient flex and extend the knee and hip joints rapidly. The action of the muscles not only drives the blood out of the deeper parts, but sucks the blood out of the superficial veins. These are found to become empty, but fill up again at once when the finger compressing the saphenous vein is removed.

(4) The foregoing tests do not "come off" when the deep veins are thrombosed.

(5) As Mayo has pointed out, in cases of thrombosis of the deep veins, the circulation in the subcutaneous veins may be essential for the comfort and well-being of the limb. Therefore, one prescribes the use of an elastic supporting bandage or stocking, which obliterates the superficial veins. If the wearing of such an elastic support adds to the discomfort of the limb, operation will do no good, but probably will do harm. If, on the other hand, the elastic support alleviates symptoms, operation will also be of benefit.

Tests (1), (2), and (3) show that an operation, such as Trendelenburg's, in which the internal saphenous vein is obliterated near the saphenous opening, will usually alleviate symptoms enormously, but that it will vary in success according to the amount of communication which exists between the superficial and the deep veins. Such an operation cannot have much effect when the external saphenous vein is also affected, which is frequently the case. The readiness, also, with which the tributaries of the internal saphenous establish a collateral circulation adds further explanation of immediate failure or rapid recurrence of the symptoms when this operation alone is carried out.

In passing, it may be remarked that test (3) offers a complete explanation of the fact that such patients, in the erect posture, are more comfortable when they are walking than when standing. The "muscle pump" acts vigorously during walking exercise. After exercise, if they remain standing, their symptoms are exaggerated, because, owing to exertion, more blood has been brought to the limb and the valveless veins, handicapped in supporting the

increased quantity of blood, become more distended, and hence pain and feeling of tiredness become more marked.

The most successful operation is that which divides not only the vein mainly at fault (the internal saphenous), but also its tributaries and communications with the deep veins. Hence, complete excision of the saphenous with ligature of its tributaries and communications was resorted to in order to make certain of cure. This necessitated an absurdly long skin wound, which too frequently became infected. The operation was a most tedious one. Then came Trendelenburg's operation, which had to be

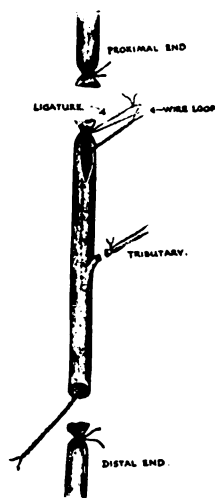


FIG. 1.—Showing Keller's method of extracting the vein.

supplemented by separate ligature of the main tributaries and communications (Phelps), and even then the results were too often unsatisfactory. The so-called "garter" incision was introduced to deal with cases in which several "leashes" of veins occupy the circumference of the limb below the knee. The site of this incision (fig. 4) is usually 1 or 2 inches below the level of the tuberosity of the tibia. The incision runs horizontally, and may have, in bad cases, to be carried right round the leg. It is made down to the deep fascia, all superficial veins are divided, secured, and partially excised. The internal and external saphenous nerves should be spared.

With American surgeons rests the honour of having developed operations which fulfil the requisites for success in such a simple

manner that one or other of them is bound to oust all other operative procedures except, perhaps, the "garter" incision, which must still be fairly often required to ensure good results.

Keller<sup>1</sup> apparently led the van. He exposed the internal saphenous vein near the saphenous opening, isolated it, tied it doubly, and divided between the ligatures. Over the lower end of the vein he made another small incision, isolated the vein, tied it distally, and divided it. From the lower end to the upper he



FIG. 2 (a).—Ring vein enucleator.



FIG. 2 (b).—Ring vein forceps.

passed a loop of wire through the lumen of the vein. The loop was passed out through a small lateral incision at the upper end of the vein, and the ligature on this part was firmly attached to it (fig. 1). When traction was made on the lower ends of the wire, the upper end of the vein was made to involute (like "flying" (*Scottice*) a stocking), and could be in many cases pulled out in its entirety. A small incision had sometimes to be made in order to divide a strong tributary, which showed its position during the extraction by causing a slight crumpling of the skin. This method, which was unsatisfactory owing to the frequent tearing of the vein, was speedily followed by other more satisfactory procedures.

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<sup>1</sup> New York : *Philadelphia Medical Journal*, August 19th, 1905.

The Mayos<sup>1</sup> had, independently, gradually evolved the following plan:—

A ring vein enucleator or ring vein forceps is used (fig. 2). The internal saphenous is isolated and divided, after incision in the upper third of the thigh. The proximal end is tied, the distal end is passed through the ring of one or other instrument and then caught by a clamp. The vein is made tense by traction on the clamp, the tissues on either side of the vein in the thigh are supported by an assistant, and the ring is pushed along the vein, under the skin, for 6 or 8 inches, tearing through the lateral tributaries *en route*. The ring of the instrument is projected against the skin, and a small incision is made down to it. The ring is then pushed through the incision, and the vein unthreaded from it and pulled out after the clamp is removed. The instrument

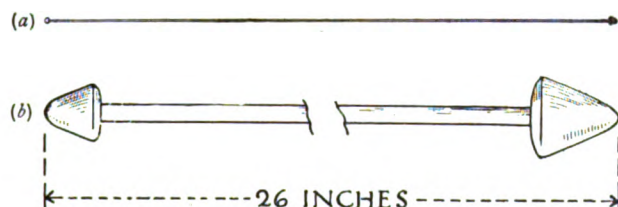


FIG. 3.—Babcock's vein extractor.

is withdrawn from the top wound, the vein is threaded through the ring again, and the process repeated. The torn tributaries have usually enough muscular and elastic structure to close spontaneously. Should the main vessel break, a new incision is made below the knee, the vein exposed and divided, and the enucleation made in both directions from this point. Below the knee the branches are larger, and the main vein more adherent, hence shorter distances are traversed. Calcareous deposits, sacculations, or extreme weakness of the walls render this method unsuitable (10 per cent.), and in such cases open dissection is practised, except opposite the knee-joint, where undermining is done. The Mayos avoid hæmorrhage chiefly by slinging the ankle at varying heights to an ordinary gynaecological standard placed at the end of the table. If there be undue hæmorrhage from any tributary, pressure by a small pad placed over the bleeding end is sufficient to stop it.

<sup>1</sup> "Surgery, Gynæcology, and Obstetrics," April, 1906.



W. W. Babcock<sup>1</sup> has produced a method which is at once the simplest, most efficacious, and most applicable to all cases. At first he used an ordinary *bougie-à-boule* (17 or 18 French), but to shorten the operation and reduce the number of incisions he introduced a special extractor. (Fig. 3.) This is practically a thick, flexible, copper or brass wire, 26 inches in length, with acorn-like expansions at either end, like the tip of a *bougie-à-boule*. The small bulbous tip is 16, and the larger 24 French, in size. Across a line extending from  $\frac{1}{2}$  inch internal to the middle of Poupart's

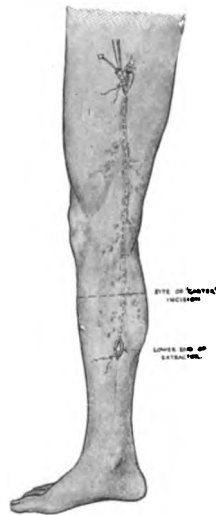


FIG. 4.—Showing (1) method of using Babcock's extractor; (2) site of "garter" incision.



FIG. 5.—To show how an ordinary *bougie-à-boule* or olivary pointed bougie may be used instead of Babcock's extractor.

ligament to the posterior margin of the internal condyle, an incision, 1 inch in length, is made, about  $2\frac{1}{2}$  inches below Poupart's ligament, through the skin and subcutaneous fat down to the muscular sheath. The index finger is passed to the bottom of the wound, pressed backwards along the muscle sheath for a short distance, and then hooked inwards and forwards. The resistant cord of the vein is felt at once. This is lifted out, and caught at the upper end by an artery forceps. The vein is incised below the forceps, and the hæmorrhage is stopped by at once introducing the smaller bulb

<sup>1</sup> *New York Medical Journal*, July 27th, 1907.

of the instrument through the opening. The extractor is now carefully passed down the interior of the vein till it meets with a marked obstruction. Babcock states that the size and shape of the acorn tip enables the extractor to slip through valves which would catch a smaller instrument. In favourable cases the instrument can be made to pass as far as the ankle. The upper end of the vein is now tied firmly with silk thread round the shaft of the extractor. The vein is then tied above and cut across below the artery forceps, and the stump allowed to retract. The lower bulb of the extractor is located. The vein in which it lies is exposed through a small incision, clamped below the bulb, and cut proximal to the clamp. (Fig. 4.) The bulb is pushed out of the wound, and traction made upon it. The vein is pulled free

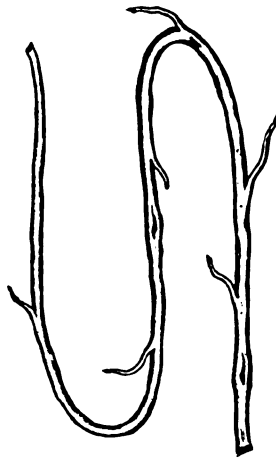


FIG. 6.—Drawing of a vein removed by Babcock's extractor. Shows well how the tributaries are torn across about an inch from the main vein.

from its surroundings, and massed, concertina fashion, in front of the upper bulb. The tributaries are torn across about an inch or thereby away from the main trunk. (Fig. 6.) In less time than the description requires, the extractor is pulled from the lower incision with a fusiform mass of vein huddled against the upper bulb. It is stated by Babcock that there is little chance of any portion of the vein that encircles the instrument being left behind. The hæmorrhage from the tract of the vein is slight, and in any case is easily controlled by a pressure bandage.

The writer has found Babcock's operation to be an eminently

satisfactory one. It is applicable in practically all cases as far as the part of the affected vein above the knee is concerned. If it is necessary to operate in thrombosed veins, it is self-evident that excision should supplant this method of operation. Excision is more suitable also when periphlebitis has caused the vein to become adherent to the surrounding tissues. The passage through the vein may be rendered difficult where the vein is much convoluted. The writer has also found difficulty occasionally, where the saphena is not much enlarged above the knee, in getting the instrument to pass a valve in the lower third of the thigh. In either case the difficulty is overcome by making a small incision over the point of obstruction, freeing the vein and milking the tortuosity over the point of the extractor, or pushing the point through the valve while supporting the vein externally; otherwise the extractor may perforate the wall of the vein when forced outwards. In the second case, however, the instrument may be withdrawn and passed from below up through an incision in the leg. To obviate any difficulty in finding the vein, the patient is made to stand erect before the operation is begun, and the position of the vein is marked above and below by lightly scoring the skin with a scalpel. The scarification shows plainly after the limb has been disinfected. The instrument should not be passed from below upwards when ulceration or phlebitis exists in the leg, and of course under such conditions special care should be taken to prevent infection of the wounds, especially that in the upper part of the thigh.

Babcock's extractor, as originally made, has the defect that the larger acorn point is not quite large enough. A wide varicose vein has the tendency to involute, as in Keller's method—the liability to tear across is then great. For this reason the writer has had the larger acorn tip made nearly half as wide again in diameter, with decided benefit in practice.

The extractor is much too long to be laid in the ordinary instrument steriliser without being bent. The repeated bending and unbending make the instrument break sooner or later near the middle. Therefore it should be provided at the centre with a narrow screw-joint, or locking catch, so that the two halves may be taken apart for sterilising purposes.

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## THE TREATMENT OF SYPHILIS IN UGANDA.

BY LIEUTENANTS H. T. TREVES AND G. T. KEANE.

*Royal Army Medical Corps.*

OUR work here commenced with an address to the Chiefs delivered by Captain Sparkes at the Baraza held at Kampala on January 27th. The Baraza is a weekly gathering of the Chiefs of Uganda, a sort of native Parliament, in fact, at which the young King Daudi (son of the tyrant Mwanga, deposed and exiled by us), the native Prime Minister, Sir Apolo Kagwa, K.C.M.G., and the three prince-regents are present, and over which His Majesty's Provincial Commissioner presides. This Baraza struck one as a picturesque and impressive ceremony. The Regents, the Prime Minister, our party, interpreters, &c., occupied seats on a raised daïs, and we, as novel features, were the objects of scrutiny of the quaintly and ornately dressed Chiefs whom we sat facing.

Some preliminary formalities having taken place, the Commissioner invited the Chiefs' attention to the Government's proposals for the alleviation of venereal disease in Uganda. Captain Sparkes then rose and with the assistance of an interpreter briefly and concisely explained the objects and aim and the importance of the work he had come to carry out. He shortly described the method of treatment, and concluded with an appeal to the Chiefs to use their influence for the benefit of themselves, their people, and for the future of their race. That they were deeply interested was obvious, and when he referred to the possibility of an improvement of the birth-rate, and held out hopes of larger and healthier families, there was something of a stir in the assembly.

On the conclusion of Captain Sparkes' remarks the Ministers and Chiefs were invited to go to the treatment rooms to witness the actual carrying out of Colonel Lambkin's treatment. Here the mercurial cream was handed round, the cleaning and sterilising of the syringe, the preparation of the patient, were shown and explained, and the injection given. Grunts and exclamations of wonder followed; then a series of very sensible enquiries were made by many of the Chiefs, some of the queries being thinly-disguised personal ones. The attendance cards were shown, on the back of which are printed in Luganda some general precautions and advice to the patients. Each Chief eagerly seized one, carrying it away as though it were some coveted prize. Assuring us that they would do their utmost to help us, they withdrew. From that

day on there has been an ever-increasing attendance, until at the moment of writing nearly 2,000 patients have placed themselves under our care. With our early patients there were some practical difficulties; however, we made a practice of retaining the previous patient till the second patient had received his or her injection, asking the former to reassure the new patient. The old patient usually entered into the rôle thoroughly.

Some difficulty threatened at first, too, in regard to reattendance on the right day, until Captain Sparkes hit upon the idea of having a special policeman told off to hunt up "black-listers."

When one considers the difficulties of the introduction of the method, the tardiness of the average civil patient at home to submit to intramuscular injection, the curious superstitions of the native about the process and about the white man generally, one really is astonished at the number of the attendances.

We heard there was an impression that the needle removed blood, which we kept and stored up. We were also supposed to be injecting fire from the spirit lamp and the hot oil.

The attitude of the patient now might almost be described as a craving for injection; indeed, our difficulty now is rather to dispose of the patient whom for various reasons we think it unnecessary to inject. Very often the patient enters the room, proceeds to undress, merely saying, "I want the injection," and this before one has had time to get any particulars.

As an instance of the keenness of the native for the treatment we relate that a Chief, living in a district where it is proposed to open a new treatment room, came in to enquire details of the date of opening and site of the new place, because, he explained, the natives under him wished to build huts conveniently near.

Apart from the interest derived from the personalities, and the quaint stories of the patients, with which we fear to occupy your space, we hope to collect information concerning certain questions on which fresh evidence may possibly be of interest. Thus: Can secondary symptoms be entirely suppressed by early and continuous treatment? How far may one rely on multiplicity of genital lesions as evidence against syphilis? The concurrence of syphilis and yaws. Extra-genital chancres.

Meanwhile, we describe here an interesting condition known to the natives as *nungu* and *bihata*. We believe it to be a tertiary syphilitic psoriasis. It is extremely common, and we shall describe it shortly. In all cases there is a history of syphilis. Our case-sheets show that it may occur any time from one year after

infection; further, it frequently occurs in conjunction with the other signs of congenital syphilis. It is equally common in both sexes. While it affects all classes of the population equally, it is the labouring classes who more often come under notice, since it directly interferes with their usefulness and capacity for work. It consists in a scaly condition of the palms of the hands and the soles of the feet. The skin first becomes thickened and later hardened and dry, leading to the formation of cracks and fissures in and around the lines of the natural folds and creases of the skin. In some cases superficial ulceration takes place around these fissures, the commonest situation for this ulceration being at the base of the toes and fingers. This condition is often associated in the hands with a chronic onychia. In the hands, the hardening of the skin and the ulceration produce much pain and incapacity, and, owing to a similar condition in the feet, in some cases the patient is even unable to walk.

The psoriasis is, in many cases, not limited to the soles of the feet and palms of the hand, but in the feet extends on to the dorsum and around the ankle-joint; in the hands on to the dorsum and up both sides of the forearm as far as the elbow. In a few cases we have noticed a triangular scaly patch on the skin over the lower part of the sacrum.

Nungu and bihata are frequently associated with the ordinary chronic tertiary ulceration of the skin. Under regular mercurial injections, and without local treatment, the condition improves strikingly. The skin becomes softened, some peeling takes place, and the fissures and ulceration disappear. The effective treatment of this condition, without resort to local application, rather mystifies the natives.

The extensive prevalence of the disease, and the resulting incapacity of its subject for labour, render its treatment an important feature in our work here.

With the exception of children under 10 years of age, all our syphilitic patients have been treated by intramuscular injection. The different opinions that are held regarding the relative values of the various methods of treating syphilis, and the cogency with which their adherents urge the value of the particular procedure they employ, are well known, but it is not easy to imagine how we could have carried on, or how the patients would fare under administrations of mercury by the mouth or by inunction methods. Here we are faced with the problem of treating a vast number of people. It is difficult to give figures—perhaps, roughly, half

the population. We have already, in Kampala alone, an average daily attendance of 200 patients. These represent, at most, weekly attendances.

The Muganda is, by nature, an irresponsible person, and our methods do not add to his cares. When he has made his weekly appearance he has done his duty; he is freed from the responsibility and we from the uncertainty of his taking triurnal doses of medicine. Again, imagine our 200 patients sitting on the grass rubbing themselves, and the staff that would be necessary for their proper supervision, or imagine our full complement of afflicted under such treatment! One would have the picture of one half of the race rubbing the other. We suggest that any other method would have been impracticable and have resulted in failure.

Whether the recommendations of Colonel Lambkin are or are not ever carried out in full here, it must be seen that he has given Uganda the only means by which one of the great problems of the future of this country may be dealt with with any hope of success.

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## THE DIAPHRAGM TEST FOR BINOCULAR VISION.<sup>1</sup>

By N. BISHOP HARMAN, M.A., M.B.Cantab., F.R.C.S.Eng.

*Lecturer in Ophthalmology, West London Post-Graduate College; Assistant Ophthalmic Surgeon, West London Hospital; Chief Clinical Assistant, Moorfields, &c.*

THIS test is the reverse of Javal's well-known "Bar-reading" test. Instead of a bar behind which the patient has to read, a hole is made in a screen through which the patient can look quite naturally and without suspecting the manner in which his vision is being "dissected."

The test rests on a phenomenon that occurs to everyone many times daily, as when a window is looked through, for then the man with binocular vision sees more widely than he who has but one eye. To demonstrate the principle of the test the following experiment may be made: Stand facing a wide view, hold up both hands palms towards you 6 inches from your face and on a level with the eyes, let the hands be separated so that the little fingers are

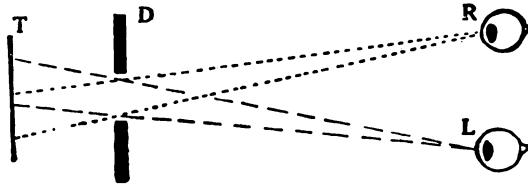


FIG. 1.

distant from each other three fingers' breadth. It will be found that the hands cover the eyes, yet a perfectly clear perception of the view is obtained. But if one eye be closed half the view is lost, for the right hand obscures the direct vision of the right eye, and the left hand that of the left eye; but the eyes see cross-wise through the space between the hands. The paths of the vision are shown in fig. 1, and the manner in which right and left monocular and also binocular vision is arranged for.

The instrument made to apply this test in practice is very simple, but a series of most varied and surprising tests may be made with it. They are so simple that the operator is not likely

<sup>1</sup> Demonstrated to the United Services Medical Society, February, 1909.



to be tied up in examining a patient, yet they are so subtle that when an expert is submitted to the test he can only escape confusion by stating simply what he sees.

#### THE INSTRUMENT.

A length of wood like a flat ruler 44 cm. long is fitted with a rack at one end to receive the test cards, and a screen measuring 9 by 6 cm. fixed at 11 cm. from the rack. In this screen, or

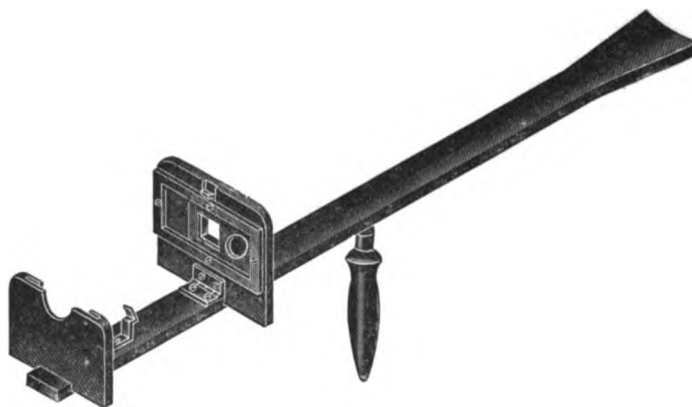


FIG. 2.—The instrument.

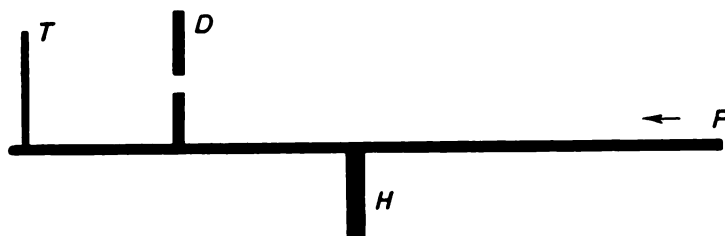


FIG. 3.—Side elevation of "Diaphragm-Test." T, test card; D, screen, or diaphragm with hole; P, position of patient who looks in direction of arrow; H, handle. Distance from T to D = 11 cm.; from D to P = 33 cm. Hole in screen is 1.7 cm. square or 1.7 cm. diameter.

diaphragm, a hole is cut; it is either square or round and measures 1.7 cm. square or diameter. A movable pin is fixed to the diaphragm so that it can be projected into the hole as a fixation point in certain experiments. A handle is fixed beneath the base board.<sup>1</sup>

<sup>1</sup> The instrument is made in suitable materials in excellent fashion by Messrs. George Culver, Limited, of White Lion Street, London. It costs only a few shillings.

*Method of Handling.*—In use the patient takes hold of the handle with both hands and places the free end of the rule (this is washable) against the upper lip just beneath the nose. The surgeon stands facing his patient, and holds the other end of the instrument to keep it steady. When the instrument is in position the patient is asked to look, either through the hole, or at the pointer projecting into it, according to the test desired, and to tell what he sees through the hole.

*Test Cards.*—There are three sorts : (1) Printed matter, of any size from diamond in set paragraphs to canon in single capitals ; (2) black or coloured squares variously disposed ; (3) pictures for children. A number are issued with the instrument, but the surgeon can make and vary the test cards indefinitely.

*The Diaphragm.*—The screen with the square hole is most generally useful, for the reading tests particularly, and when we wish to demonstrate the presence of binocular vision where it is denied. When the patient looks clear through the hole at the test the margins of the hole are seen doubled, the square becomes an oblong ; this change escapes remark save by the most observant. On the other hand, when it is desired to demonstrate weakness of binocular vision, or in fusion experiments, the round hole is the better, as reduplication of the circle and overlapping of the two images is very noticeable.

#### THE USES OF THE DIAPHRAGM TEST.

The test is of value for the following purposes :—

- (1) To determine the equality of visual acuity in the two eyes.
- (2) To determine the presence, the absence, or a defect of binocular vision.
- (3) To exercise the vision in squinting eyes.
- (4) To detect malingerers feigning monocular blindness.
- (5) To demonstrate certain physiological phenomena connected with the perception and suppression of images.

##### (1) *Equality of Visual Acuity of the Two Eyes.*

A paragraph of printed matter is put in the test rack, the patient is desired to read it. The plan of the instrument is such that three kinds of vision are required to pass the test. The right half of the test is read by the left eye, the left half by the right eye, and the middle strip by both eyes (fig. 3). If the patient can detect no difference in the clearness of the letters on the card, the eyes have

equal vision. The test is very delicate. Further, this cannot be passed unless there be good balance of the oculomotor muscles.

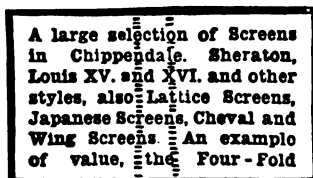


FIG. 3.

(2) *Binocular Vision and its Defects.*

The preceding test when small type is used is the most delicate test of this nature—a small degree of latent squint will prevent a man from reading the paragraph accurately. The phenomena produced by the various orders of latent squint can be best shown by the use of the test-card with a single line of letters or figures :—

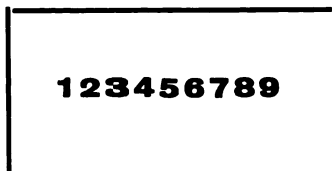


FIG. 4.

The man with good binocular vision reads 1 2 3 4 with the right eye, 6 7 8 9 with the left, and 5 with both eyes (fig. 4).

In convergence (esophoria) the middle letters are overlapped and are suppressed so that the man reads something like this :—

**126789**

In divergence (exophoria) the middle letter is reduplicated, and the man reads :—

**12345 56789**

In vertical displacement (hyperphoria) the parts of the line of letters seen by each eye are on different lines or levels, thus :—

**12345**  
**56789**

All these phenomena can be seen by the surgeon himself who has perfect binocular vision when he causes disturbance of his muscles by putting a prism before one eye, or more simply by just displacing one eye slightly by gentle pressure with one finger.

It is astonishing how readily this simple device displays latent irregularities in the muscle balance of the eyes.

In the case of children suspected of squint, their capability for binocular vision can be ascertained by the diaphragm test more easily and at an earlier age than by any other means. There are a series of bold and simple drawings of familiar objects supplied with the instrument (fig. 5). The child looks at a pair of pictures

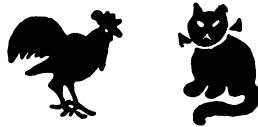


FIG. 5.

through the hole of the diaphragm; if they are named promptly there is good evidence that the vision of one eye is not suppressed. The youngest patient I have yet tried with the test was a girl, aged 2 years and 5 months; she had not seen these particular pictures before, but she named them all correctly looking at them through the hole, and she wanted to see some more!

### (3) *Exercises for Squinters.*

Monocular alternate fixation and binocular fusion can be practised through a series of graded tests from coloured patches, pictures, and large letters to small print.<sup>1</sup> When one eye by reason of disuse has a lesser visual acuity than the other, the superiority of the better eye can be reduced by paralysing the accommodation of that eye with atropine, by shading the half of the tests to be seen with that eye, or by placing such a glass before that eye as will reduce the vision to an equality with the weaker eye.

### (4) *Detection of Malingerers.*

We cannot have too many tests for the detection of feigned monocular blindness, but a good test must be *simple*. Here is one that is so simple that the surgeon cannot get tied up in using it; yet it is so subtle that an expert can be trapped.

There are test cards with squares printed thereon, coloured red and green, or black for use with the colour-blind. The squares are printed right and left—any number may be used, but one each side

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<sup>1</sup> A very cheap form of instrument with test cards is made for patients' use.

is enough—and the patches are on different lines so that they cannot be fused by convergence (fig. 6). The cards are reversible, so that the red and green cards can be exhibited four different ways—red to right, to left, above, or below.

One of these cards is put in the rack and the patient asked what he sees. (1) He may be told to look through the hole; then he sees the patches as they are on the card and must name them. Suppose the man knows the patches are seen by crossed vision and correctly evades naming the patch seen by the pseudo-amaurotic eye, yet he does not escape, for the surgeon, watching his eyes, will see the *co-ordinate movements of the eyes as he looks from one to other area of crossed vision*. A man truly blind of one eye does not do this. (2) He may be told to look at the pointer and so converge;



FIG. 6.

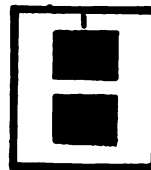


FIG. 7.

then he gets homonymous diplopia for the patches and one appears above the other (fig. 7). When seen in this latter fashion it is impossible for the patient to guess the card, whether one or other eye or both eyes see the patches; even the cards may be changed so that the red is seen by the right and left eyes alternately, yet the change will not be detected.

The test is so good that there is no objection to the patient seeing all the test cards laid out on the table beforehand. During the testing the surgeon has the man's eyes under perfect observation; at the suggestion of a wink on the part of the man the test can be dipped and obscured. Lastly, even when the eyes differ considerably in visual acuity, the test with coloured patches can be used successfully, for colour can be perceived when form is obscure.

(5) *Physiological Alternation of Perception and Suppression of Diverse Images.*

There is one test with which very curious results may be obtained. On one half of a test card is drawn a cross of St. George; on the other half is drawn a cross of St. Andrew (fig. 8). The

crosses are placed in such relations that when the test is in position and the pointer is set in the hole of the diaphragm, and the two eyes are fixed upon it, the images of the crosses are superimposed and fused. Now for a moment the fused images of the crosses present the appearance of a star of eight points. But it will be found that this appearance is not constant for the whole time of the observation; there succeeds an alternation in the perception of the images seen by the right and left eyes, so that as though by an electric flashing sign the crosses of St. George and St. Andrew pulsate upon the screen. The experiment can be varied by the use of a variety of geometrical figures, parts of circles, &c.

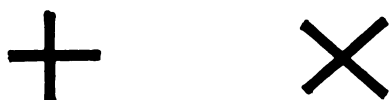


FIG. 8.

The effect is very curious, and the seemingly definite rhythm of the alternation suggests some reason for the phenomenon. There are two possible explanations: (1) That fixation is not constant, and that unconsciously it falls off, but is renewed when the fading of the images occurs. (2) That since in perfect binocular vision the two maculæ and the two halves of the brain have learned to view and perceive but one object of fixation at a time, that now the brain is incapable of retaining constantly the perception of two dissimilar objects seen by the two maculæ. The brain does it for a moment at the instant of the first attempt, but then the image of one and then of the other object is perceived and suppressed in turn. We may suppose the visual apparatus reverts to a primitive separated condition!

#### CONCLUSION.

In conclusion I suggest that the "Diaphragm Test" puts a very useful and handy every-day servant in the hands of the ophthalmic surgeon—one that will tell him many secrets with a minimum of explanation and direction to the patient; and that the test is not unworthy to be considered one of the simplest methods for the experimental demonstration of binocular vision.

AN OUTBREAK OF SIMPLE CONTINUED FEVER  
ASSUMING EPIDEMIC FORM AMONGST NON-COM-  
MISSIONED OFFICERS AND MEN OF "C" COM-  
PANY, 4TH BATTALION RIFLE BRIGADE.

BY CAPTAIN P. F. MARETT.  
*Royal Army Medical Corps.*

At the present time when attention has been drawn to simple continued fevers or pyrexias of uncertain origin by the various papers on the subject which have appeared in the Journal (Lieutenant-Colonel J. J. Gerrard and Lieutenant-Colonel C. Birt), it may be of interest to put forward the history of an epidemic form of febricula which attacked "C" Company of the 4th Rifle Brigade stationed in Floriana Barracks, Malta, during the summer of 1907.

In 1906, for its first hot weather in the island, the battalion was stationed in St. George's Barracks, Pembroke, and had an incidence of eighty cases of simple continued fever; in 1907 the number of admissions while in Floriana was 119; whilst in 1908, when stationed in St. Andrew's Barracks, there were only seventeen cases of pyrexia of uncertain origin.

It is this increase in their second year's service in the command which is the subject of this paper. During that year I happened to be Medical Officer in charge of the battalion and again had medical charge of it during 1908.

The cases dealt with are from the admission and discharge books of the various hospitals, and no mention is made of the men treated on barrack hospital treatment.

The battalion was split up and four companies were stationed in Floriana, which was the headquarters, the remaining four companies occupying the huts in Manoel. Of the 119 admissions, twenty-six were from Manoel or from companies in musketry camp; the remaining ninety-three were from Floriana.

The following is the monthly incidence of these cases:—

January .. —	April .. 2	July .. 34	October .. 1
February .. —	May .. 2	August .. 27	November .. —
March .. —	June .. 17	September 10	December .. —

On June 18th, 19th, and 21st, cases of fever came from No. 1 Room, C Block, and from this time till the company was sent for change to Imtarfa, cases of fever were of common occurrence.

The accompanying spot-map, made at Lieutenant-Colonel J. J.

Gerrard's suggestion, shows not only the distribution of the cases but the following points:—

(1) That the fever began in C Block, and that in June, out of seventeen admissions ten came from this block. In July, out of thirty-four admissions twenty came from C Block.

(2) In August, after C Block had been evacuated, the majority of the cases came from B Block, situated next to C, *i.e.*, out of twenty-seven cases thirteen were from B Block.

SPOT-MAP SHOWING INCIDENCE OF CASES ADMITTED TO HOSPITAL.

Blocks	Room 1	Room 2	Room 3	Room 4	Totals					
A	•2·8 •8·8	•26·7 •31·7 • 1·8 •13·8 •26·9	• 5·7 • 2·8	•20·8 •30·9	11					
	• 9·7 • 5·8 •15·8 •16·8 •26·8 • 4·9 •16·9 •17·9	•22·7 • 5·8 • 5·8 •12·8 •21·8 • 1·10	• 9·7 •20·7 • 9·8 •10·8 •16·8 •17·8	•26·6 •28·6 •11·7 •22·7 •10·8		25				
B	•18·6 •19·6 •21·6 •24·6 •13·7 •14·7 •26·7	• 8·6 •21·6 • 3·7 • 4·7 • 5·7 •13·7 (N.C.O.'s Bunk 2) •13·7 •15·7 •17·7 •18·7 •22·7 • 3·9	•30·6 • 5·7 • 9·7 • 9·7 •13·7	•20·6 •24·6 •26·6 • 1·7 • 6·7 •13·7 •13·7	31					
	•17·8 •31·8	•30·4 • 1·8 • 3·9	•27·4 •30·6 • 2·8	•11·5 •28·6		•20·7 •18·5 •29·7	•23·9	• 5·9	•17·8	16
Married quarters, <i>et alia</i>	•23·6 •26·6	• 1·7 •12·7 •17·7	• 3·8	•16·9	3 unaccounted for			..	..	
Grand total	..	..	..	..	..	..	..	..	..	93

As the fever began with three cases in No. 1 room in C Block, the precaution was taken to disinfect the room by means of the equifex spray.



All the cases suffered from the following initial symptoms : temperature 102° to 103° F. or more, slow pulse-rate when compared with the temperature, pains in the back, headache, furred tongue, foul mouth and constipation, together with conjunctivitis and pharyngitis. The conjunctivitis was well marked, the blood-shot eyes being much in evidence.

The patients were examined for vesicles on the palate, as I thought the epidemic might be influenza ; these were found to be present. The soft palate was irregularly studded with vesicles which stood out well on the mucous membrane, but were principally distributed over the centre and sides of the soft palate, and in many instances extended on to the uvula ; accompanying these the palate was injected. The contents of the vesicles were examined and the following technique was employed in collecting their contents : The patient was first made to gargle with a 1—5,000 hydrarg. perchlor. solution, then with normal saline, after which a vesicle was pricked with a platinum needle and the needle transferred to the culture medium. Instead of obtaining the bacillus of influenza the resulting growth proved to be a large coccus with no very definite grouping.

The medical officers of the hospitals (Valletta and Cottonera) informed me that the cases were diagnosed as simple continued fever and that there were no serum reactions ; the stay in hospital was from six to twelve days in the majority of the cases.

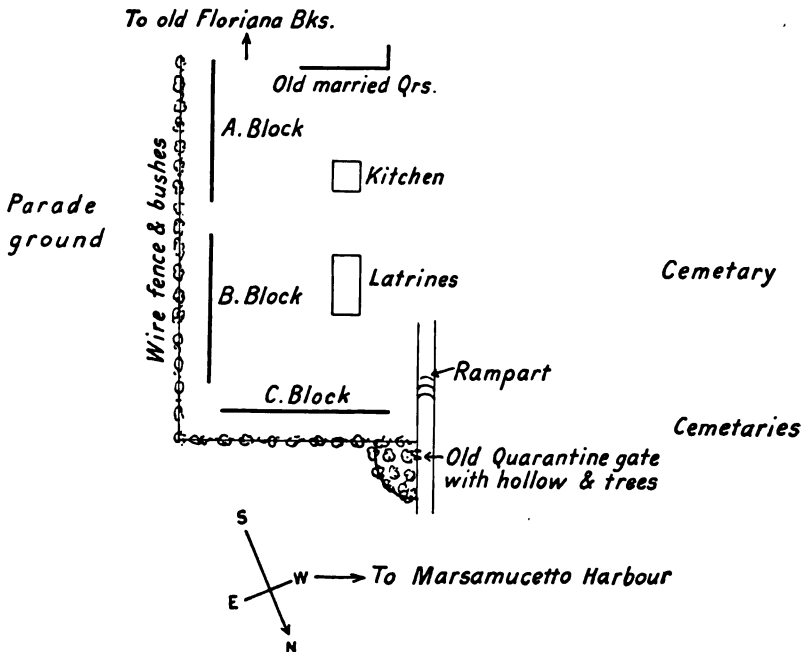
Investigation brought out several probable factors which will now be discussed :—

(1) Position of C Block ; (2) over-exertion in hot weather ; (3) exposure to the sun ; (4) mosquitoes and sandflies ; (5) made soil and foul ground.

(1) *Position of C Block.*—Floriana Barracks consist of an old and a new portion ; the former is not occupied except for the huts in Notre Dame Bastion, which are well situated, overlooking the P. and O. Harbour and built on high rocky ground. The new portion consists of three modern blocks, with corresponding out-buildings erected in 1903. Each block is built on the same plan and consists of double stories with two rooms on each floor.

A and B Blocks face the parade ground looking in an easterly direction ; C Block is placed at right angles and faces the north. To the left of C Block and within 10 yards the ground falls away to a hollow leading to the old Quarantine Gate ; this depression is cone-shaped and shut in by trees, and the ground used to be fouled by Maltese, a certain percentage of whom are known to suffer from ambulatory Mediterranean fever. The area was in consequence

frequently in a most unsanitary condition. Between these blocks and the harbour on the west there are disused cemeteries. On inquiring about the hollow it was found that C Block is built on "made ground," the hollow being all that is left of an original dip; most of it had been filled in to allow of the block being built. The nature of the material used for the filling could not be ascertained, but probably it was builder's rubbish.



PLAN OF NEW PORTION OF FLORIANA BARRACKS OCCUPIED IN 1903.

(2) *Over-exertion in Hot Weather.*—As regards the habits of the men—their feeding, clothing, and their bathing—all these were identical with those of the remainder of the battalion. As regards exercise, the company was undergoing training and was also carrying out a gymnastic course. These two were thought to be giving rise to over-exertion, and it was recommended that they should be curtailed, but with no good results; and it must be mentioned that "B" Company in Manoel was carrying out exactly the same programme without bad effects.

(3) *Exposure to the Sun.*—"C" Company did not suffer from exposure to the sun to any greater extent than the rest of the

battalion. The fatigue hats worn by the men were thick naval straws, provided with puggarees, the hats being pierced on opposite sides to allow of free ventilation. They were light, well-ventilated, and gave plenty of shade and were used by the whole battalion.

(4) *Mosquitoes and Sandflies.*—The spraying of No. 1 Room, C Block, proved that both mosquitoes and sandflies were present in large numbers, and the retardation of the spread, after disinfection, which caused the destruction of these pests suggests that they may have been a factor; but both mosquitoes and sandflies were present in large numbers in A and B Blocks as well.

The cause of so many mosquitoes being present in spite of preventive measures being carried out was traced to the presence of a water channel on Civil Government ground, which was badly pooled and in which weeds were growing. This channel leads from Floriana ridge down to the Quarantine harbour, passing within 100 yards of C Block and carries off storm water and road washings. The proximity of the trees and other vegetation was blamed for the presence of the sand-fly. These insects alone could not have been the cause of the outbreak, otherwise the companies in A and B Blocks would have suffered at the same time; whereas it is noticeable that the company in B Block was more markedly affected when C Block was evacuated.

(5) *Made Soil and Foul Grounds.*—That "made soil" gives rise to earth emanations is well known and the question is: "Are the earth emanations alone responsible for the outbreak?"

The commonest disease which assumes epidemic form at home during the summer is infantile diarrhoea. With reference to summer diarrhoea, Ballard, in the Local Government Reports on summer diarrhoea for 1887, stated that "the summer rise of diarrhoeal mortality does not commence until the mean temperature recorded by the 4-foot earth thermometer has attained somewhere about 56° F." It is also well known that the prevalence of summer diarrhoea varies inversely with the rainfall and directly with the temperature.

These observations were worked out with reference to towns built on "made soil" where infantile summer diarrhoea is prevalent, especially in Leicester and other large towns. Here, therefore, given a different micro-organism we have the "made soil" and foul ground and the climatic conditions for earth emanations—viz., heat and a dry porous soil.

That infantile summer diarrhoea, once it shows itself, is spread by the common house-fly, which infects food stuffs, is common

knowledge. Now, in this epidemic, house-flies were not prevalent, nor was food apparently left exposed long enough to be infected by mosquitoes and sand-flies, whose nocturnal habits are well known. Rations were cooked in a cook-house common to B and C Blocks, and the food was eaten the same day.

The only way in which the foul ground and biting insects can be together made responsible, more especially since Lieutenant-Colonel Birt in the December Journal brings forward Doerr's report on Pappaticfieber, is that the sand-flies inhabiting the trees in front of C Block fed alternately on the foul ground and on the men and so produced the fever by direct inoculation of individuals.

Before closing this paper I would like to make special mention of the two signs which I have referred to earlier; they are the conjunctivitis and the pharyngitis, both lesions of the mucous membranes. Are these the site of primary inoculation, or are they only symptoms of the disease? If they are the site of inoculation, then the mode of inoculation must be sought. If infection be due to foul dust, then sand-flies and biting insects are at a discount. Is it possible that sand-flies, minute as they are, are able to reach the pharynx and conjunctiva and so inoculate the mucous membranes?

The last point requiring discussion is: Why are no micro-organisms found in the blood-stream? Authorities have put forward the theory that such organisms are ultra-microscopical. May it not, however, prove to be a local infection (as of the pharynx) which has been overlooked, setting up a sapræmia, the toxins giving rise to the symptoms, and the organisms only appearing in the blood-stream when the infection is extreme?

If this be so, may it not be possible that a coccus which ordinarily grows in the mouth cavity is able to penetrate the mucous membrane when its host's resistance is lowered either by chill or by exposure to the sun, and establishing itself in the abnormal position gives rise to symptoms? If this be the case neither sand-flies nor foul ground would be factors, and the disease could be spread by aerial means similar to influenza.

If the conjunctivitis and pharyngitis are only symptoms I trust they may help towards the elucidation of a type of what at present are known as pyrexias of uncertain origin.

My own belief is that foul ground and biting insects were together responsible for this epidemic.

As I have mentioned, I was also in charge of this battalion during the following year, 1908, when it was stationed in St. Andrew's Barracks, where there were only seventeen cases

of pyrexia of uncertain origin during the year for the whole battalion.

This extraordinary difference is not easy to account for; the men were living under the same conditions of food, work, and clothing, and the barracks resemble one another very much.

Both St. Andrew's and A, B and C Blocks, Floriana, are new barracks, the former being occupied in 1905 and the latter in 1903. Both are about 200 feet above sea level, and although the Floriana barracks are nearer the sea, yet the distance from each bathing place is about half a mile and up a road which is steeper than that to St. Andrew's from the bathing place in St. George's Bay.

The only point to the disadvantage of Floriana Barracks is their proximity to Floriana and to Valletta.

The huts in the Notre Dame Bastion, Floriana (occupied by F Company and the Band in which the incidence of fever was, as is seen by the spot-map, both less and sporadic) resemble St. Andrews' Barracks in being more exposed to the wind and also in being built on rocky ground.

TABLE SHOWING THE MONTHLY INCIDENCE OF CASES OF FEVER PER BLOCK.

BLOCK	January	February	March	April	May	June	July	August	September	October	November	December	Grand Totals
A	..	..	..	..	..	..	3	6	2	..	..	..	11
B	..	..	..	..	..	2	6	13	3	1	..	..	25
C	..	..	..	..	..	10	20	.. evacu- ated.	1	..	..	..	31
Notre Dame..	..	..	..	2	2	2	2	5	3	..	..	..	16
Married Quarters <i>et alia</i>	..	..	..	..	..	3	3	3	1	..	..	..	10
Totals .. ..	..	..	..	2	2	17	34	27	10	1	..	..	93

It is also interesting to note that last year (1908) when Floriana Barracks were occupied by another battalion, the total admissions to Valletta Hospital for fever for the battalion were sixty-two, twenty-six of which came from C Block.

AN ACCOUNT OF A THREATENED OUTBREAK OF  
DIPHThERIA IN THE DUKE OF YORK'S ROYAL  
MEDICAL SCHOOL AND THE MEASURES ADOPTED  
TO STAMP OUT THE DISEASE AND PREVENT IT  
ASSUMING AN EPIDEMIC FORM.

BY LIEUTENANT-COLONEL SIR JOSEPH FAYRER, BART.  
*Royal Army Medical Corps.*

Two years ago I submitted a report of an outbreak of diphtheria which occurred in this School, showing the measures successfully adopted to stamp out the disease. In brief, they were as follows: Bacteriological examination of every throat in the School, students and boys—600; isolation of all carriers—180; prophylactic inoculation of all boys and students. On this occasion thirty cases of diphtheria were sent to the Metropolitan Asylums Board Hospital, but the steps taken immediately arrested the spread of the disease in the School.

I now submit an account detailing the measures adopted for checking a threatened outbreak.

Since the epidemic referred to above on a boy reporting sick with sore throat, I have immediately taken a swab and sent it for bacteriological examination.

Until October 5th, 1908, examination of the swabs proved negative as regards the Klebs-Loeffler bacillus; but on that date a swab was taken from a child of one of the staff of the School, who was suffering from sore throat and sent to the Specialist Sanitary Officer, London District, who reported next day that the patient was suffering from diphtheria. By October 22nd seven cases had occurred, and as these cases were not confined to any one dormitory or schoolroom, but were distributed generally throughout the institution, I felt justified in thinking I might anticipate an epidemic. The situation presented itself to me as follows:—

(1) There were seven cases of diphtheria scattered all over the institution.

(2) In all probability these seven had infected others.

(3) It was quite reasonable to assume that throughout the School there were many "carriers."

(4) It could only be a matter of time for an epidemic to spread.

(5) To allow matters to go on with a view of ascertaining what was going to happen would endanger the institute.

Bearing these points in mind I recommended :—

(1) The immediate disposal of those actually suffering from the disease, with isolation and prophylactic inoculation of all who had been in contact with them.

(2) The prophylactic inoculation of all the boys and students of the school (542 boys and 40 students), and inoculation of any others, officers, &c., who might volunteer to undergo the operation.

(3) The bacteriological examination of swabs taken from every individual in the institution with a view to isolate and treat any proved to be "carriers," the latter to be kept isolated until two examinations had proved negative.

(4) Examination of individuals working in the institution, *e.g.*, schoolmasters, charwomen, &c., who reside outside but come in daily to work.

(5) Disinfection of all rooms occupied by infected.

(6) Closing of School Chapel to the general public.

(7) Sterilisation of band instruments and files once a week. This was done by boiling brass mouthpieces for several hours and by soaking reeds and wood instruments in carbolic acid lotion 1—20.

(8) That boys' friends should not visit them.

(9) That boys should not be allowed on general "Pass," and only in the parks under the supervision of their colour-serjeants.

(10) Morning and evening gargling parades, every boy gargling, under supervision, with a solution of permanganate of potassium.

(11) Sterilisation of all milk.

(12) Examination of drainage system.

I wrote to the Director-General, Army Medical Service, through the Commandant of the School, asking for a supply of 750 sterile swabs, 750 blood serum culture tubes, and 750,000 units of anti-diphtheritic serum for inoculation purposes. The swabbing, planting and inoculations I did myself; the bacteriological examinations were performed at the Royal Army Medical College by Lieutenant-Colonel Leishman and his assistants, and by Captain Stratton, the Sanitary Specialist.

Having received the 750,000 units of serum and the tubes and swabs, I applied to the M.A.B. for the services of a special nurse, who two years ago helped me to prepare the boys for inoculation and to syringe out the throats of all the "carriers" with a solution of sodium bicarbonate and hydrogen peroxide. The

nurse arrived on October 23rd and I commenced my inoculations the next day.

With the exception of twenty-four boys (contacts) who were inoculated on October 17th all the inoculations were performed between October 22nd and October 27th, bringing the total number to 574, *i.e.*, boys 535, officer 1, students 38.

While the inoculations were going on, and for a long time after, I received daily reports from the officers who were conducting the bacteriological examinations, and whenever these reports gave positive results the boys were immediately isolated.

On November 6th the situation was as follows:—

Boys .. ..	In M.A.B. Hospital ..	5 ..	In isolation as carriers ..	49
Students .. ..	.. ..	1 ..	.. ..	2
Women .. ..	.. ..	1 ..	.. ..	2
Staff, children ..	.. ..	2 ..	.. ..	6
Officers .. ..	.. ..	0 ..	.. ..	1
Schoolmasters ..	.. ..	0 ..	.. ..	7
Staff .. ..	.. ..	0 ..	.. ..	1

Out of the "carriers," sixty-one (boys, students and staff) were isolated, and kept in isolation until two negative examinations had been made. During their isolation they were daily inspected, and the mouth having been cleaned with a saturated solution of bicarbonate of soda, the throat and fauces were thoroughly syringed out with a solution of hydrogen peroxide.

The remaining seven cases (schoolmasters) were kept away from school and attended the hospital daily to undergo the same treatment. The results of this treatment were most satisfactory, bacteriological examination giving negative results, in most cases after two days' treatment.

*Serum Rashes, &c.*—After the administration of anti-diphtheritic serum to 535 boys, 38 students, one officer, and one child, 195 cases of skin eruptions, pruritus and joint pains resulted. The eruptions, whether local or general, and whether causing pruritus or not, all had the same characteristics: they were all urticarial, varying only in degrees of intensity as regards the surface covered and the sizes of the urticarial "lumps." When I speak of local rashes I mean those which occurred on the abdomen; around the seat of puncture in some cases there were a few, two or three to half a dozen, spots; in others, the rash covered the whole of the front of the abdomen. The general rashes literally covered the whole body, causing puffiness of the lips and palpebral regions, and making the eyes red and watery. The general rashes also varied in intensity and severity, some, though covering the whole surface, not causing



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œdema, while in others œdema was marked. All the cases, as long as the rash lasted, suffered most acutely as a result of the irritation, some of the boys being entirely covered with scratch marks. Fortunately, the duration of the discomfort resulting from the rashes lasted only from a few hours to forty-eight hours, and the irritation was somewhat relieved during the acute stage by the application of lot. acidi carbolici. Many relapses occurred, boys having a second or third attack. In some cases the œdema was very extensive, the lips being swollen, eyes closed up, or very nearly so, and the penis and scrotum infiltrated.

Out of 574 cases inoculated, there was not a single case of local inflammation, *i.e.*, no redness or hardness round seat of puncture, no sores and no abscesses.

Though the urticarial characteristic of the rash was maintained throughout, the appearance in individuals varied somewhat. In some cases, general and local, the appearance of the patient suggested having been beaten with bunches of nettles; the general erythema varied in colour, from bright red to a deeper, almost claret colour, and was spotted all over by small white "lumps," sometimes coalescing and sometimes punctiform, very much like herpes. In other cases the white "lumps" were large and irregular in shape, sometimes as large as the palm of the hand.

The following table gives the date of appearance and the character of the rash, whether local or general, in each case.

Date	General rash		Local rash		Total
1st day .. ..	6	..	—	..	6
2nd „ .. ..	8	..	7	..	15
3rd „ .. ..	—	..	5	..	5
4th „ .. ..	1	..	9	..	10
5th „ .. ..	—	..	19	..	19
6th „ .. ..	5	..	19	..	24
7th „ .. ..	25	..	17	..	42
8th „ .. ..	31	..	12	..	43
9th „ .. ..	22	..	4	..	26
10th „ .. ..	1	..	—	..	1
11th „ .. ..	1	..	—	..	1
12th „ .. ..	1	..	—	..	1
13th „ .. ..	1	..	—	..	1
14th „ .. ..	—	..	1	..	1
	102		93		195

*Interesting Points Noted.*—Those boys who had been inoculated two years ago were more susceptible to the action of the serum, and their rashes developed very quickly—in three cases within a

few hours of being inoculated—and they were literally smothered in rash.

Boys of A, B, and C Companies suffered more severely than the other boys. These boys belong to the band, drums, and bugles, and it is suggested that the efforts of blowing the wind instruments in some way rendered them more sensitive to the action of the serum.

Boys who were in hospital and those in isolation suffered very much less severely than the others—indeed the boys in hospital suffered no after consequences. It would appear that, generally speaking, the appearance of rashes, and the severity of symptoms, varied directly with the amount of physical exercise taken after the inoculation.

As regards the students, out of 38, 20 developed rashes and 3 rashes with joint pains. These lads were given calcium lactate according to instructions, and there seems no doubt that they suffered less as a result of taking the drug, as the rash in every case was a local one.

In my own case the rash appeared on the eighth day and was quite local, there being about half a dozen urticarial and very irritable spots round the seat of puncture; this all passed away in a few hours. I took no drug, but avoided anything in the shape of violent exercise.

The joints usually affected were the knees, ankles, and temporo-maxillary. Boys suffering from swelling of the temporo-maxillary articulation presented the appearance of a patient with unilateral mumps. In three cases admission into hospital was necessary; they were treated with salicylate of sodium.

*Source of the Infection.*—There are eleven schoolmasters, and seven of them, all living outside at Battersea and Fulham, proved to be infected. The charwomen, who attend the institution daily to work and come from the slums of Battersea and Chelsea, were found free from infection.

The source of the infection might have been the boys, or the masters. That is, either the masters who live outside became “carriers” as a result of their environments, or as a result of being in contact with their children, who attend schools in the neighbourhood, or the boys became “carriers” as a result of their walks abroad, and so infected the masters who were constantly in school with them. Either of these theories is possible, but the evidence is rather in favour of the masters originating the outbreak, as two of them living in the institution were found free from infection on

bacteriological examination, and two who live in a different neighbourhood to the others, one of them having no children, also proved not to be carriers. But however the disease originated it is remarkable how many boys were actual "carriers" of the disease. On December 16th the school was entirely free from diphtheria, no cases having been reported since October 29th, 1908.

*Summary.*—(1) On October 5th the first case of diphtheria was diagnosed, and by October 22nd seven cases had developed. All the cases were distributed throughout the institution, no dormitory being especially attacked. A bacteriological examination of the throat of every member of the Institution, except three babies and two ladies, was then made, and 68 "carriers" were detected. All the carriers were at once isolated.

(2) A prophylactic injection of anti-diphtheritic serum was then given to 535 boys, 38 students, and one officer.

(3) After October 29th no further cases of diphtheria developed, and on December 16th the school was quite free from the disease.

(4) The detection and prompt isolation of the carrier cases probably prevented a serious outbreak of diphtheria in the school.

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## THE SEDIMENTING EFFECTS OF THE SERA OF COWS ON SOME BACILLI OF THE TYPHOID GROUP.<sup>1</sup>

By MAJOR F. SMITH, D.S.O.

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IN searching for a possible animal host of the bacillus of typhoid fever the results set out below were obtained. Though by no means conclusive, as far as the incrimination of the cow is concerned, they are thought to be of sufficient interest to warrant publication. More than 240 cows have been examined, but they are not all accounted for in the tables. The results cannot be given in percentages of the total because the methods were not the same throughout; moreover some of the data were for various reasons considered not absolutely reliable. Tables I., III. and IV. show consecutive examinations.

### FIRST SERIES. (*See Table I.*)

The sera of eighteen cows were examined with dead bacilli. The same emulsion of bacilli was used for them all; it has proved reliable in diagnostic work. The sera were put up in batches and they acted as controls to each other. The sera of human beings put up with the same emulsion were also regarded as controls.

### SECOND SERIES. (*See Table II.*)

The precaution was taken of using different strains of bacilli—three fresh ones were procured from stations other than Rawalpindi—moreover, living cultures were used. Some of the sera were put up in a dilution of 1 to 10.

The results in the second series are seen to be not quite the same with each strain used. *Bacillus typhosus kasauli* is, however, an easily sedimented strain as compared, for instance, with *B. typhosus richards*; put up with the same specific serum the former shows a complete positive result at 1 to 1,600, whereas the latter is complete at 1 to 800.

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<sup>1</sup> Part of this paper was read at a meeting of Sanitary Officers in Poona, on December 2nd, 1908.

## THIRD SERIES. (See Table III.)

Living paratyphoid cultures were employed in this series, and the same sera were put up with *B. typhosus* for comparison.

In the main these results accord with those obtained with dead bacilli.

TABLE I.—SHOWING RESULT OF EXAMINATION OF THE SERUM OF THE OX WITH DEAD BACILLI OF THE TYPHOID GROUP IN SEPTEMBER, 1908.

Serial number	WIDAL REACTION TO												Remarks
	Typhoid bacillus				Paratyphoid bacillus A				Paratyphoid bacillus B				
	Dilution				Dilution				Dilution				
20	40	80	160	20	40	80	160	20	40	80	160		
1	+	-	-	-	+	+	-	-	-	-	-	-	The sera in four dilutions were mixed with an emulsion of dead bacilli. None were put up in higher dilutions than 160. The mixtures were kept in Wright's tubes and examined after 20 hours. Dilutions below 1-20 were not employed.
2	+	-	-	-	+	+	-	-	+	+	-	-	
3	+	-	-	-	-	-	-	-	-	-	-	-	
4	-	-	-	-	+	-	-	-	+	-	-	-	
5	-	-	-	-	-	-	-	-	+	-	-	-	
6	+	-	-	-	+	-	-	-	-	-	-	-	
7	+	+	-	-	-	-	-	-	+	-	-	-	
8	+	-	-	-	+	+	+	-	+	+	+	+	
9	+	-	-	-	+	+	-	-	+	-	-	-	
10	-	-	-	-	+	+	+	-	-	-	-	-	
11	+	-	-	-	+	+	-	-	+	+	+	-	
12	-	-	-	-	+	-	-	-	-	-	-	-	
13	-	-	-	-	+	-	-	-	+	-	-	-	
14	-	-	-	-	+	+	-	-	-	-	-	-	
15	-	-	-	-	-	-	-	-	-	-	-	-	
16	-	-	-	-	-	-	-	-	+	-	-	-	
17	+	-	-	-	+	+	-	-	+	+	+	+	
18	-	-	-	-	-	-	-	-	+	-	-	-	

+ means complete sedimentation.

I } means incomplete sedimentation.

T } means a trace of sedimentation.

- means no sedimentation.

TABLE II.—SHOWING REACTION OF SERA OF COWS TO SEVERAL STRAINS OF  
BACILLUS TYPHOSUS (LIVING CULTURES OF TWENTY-FOUR HOURS' GROWTH).  
NOVEMBER TO JANUARY.

Serial number	<i>B. typhosus</i>					Remarks	Serial number	<i>B. typhosus</i>					Remarks
	Dilution							Dilution					
	10	20	40	80	160			10	20	40	80	160	
1	...	—	—	—	—	B.T. Richards.	22	T	T	—	—	—	B.T. Richards.
2	...	+	+	—	—	„ Kasauli.	„	+	+	—	—	—	„ Kasauli.
3	...	+	+	—	—	„ „	„	+	+	—	—	—	„ Peek.
4	...	+	+	—	—	„ „	„	+	+	—	—	—	„ Richards.
5	...	+	+	—	—	„ „	23	+	+	—	—	—	„ Kasauli.
6	...	+	+	—	—	„ Richards.	„	+	+	—	—	—	„ Peek.
7	...	+	+	—	—	„ „	„	+	+	—	—	—	„ Richards.
8	...	+	+	—	—	„ Richards.	„	+	+	—	—	—	„ Kasauli.
9	...	+	+	—	—	„ „	„	+	+	—	—	—	„ Peek.
10	...	+	+	—	—	„ Kasauli.	24	+	+	—	—	—	„ Richards.
11	...	+	+	—	—	„ „	„	+	+	—	—	—	„ Kasauli.
12	...	+	+	—	—	„ „	„	+	+	—	—	—	„ Peek.
13	...	+	+	—	—	„ Richards.	25	+	+	—	—	—	„ Richards.
14	...	+	+	—	—	„ Kasauli.	„	+	+	—	—	—	„ Kasauli.
15	...	+	+	—	—	„ Richards.	„	+	+	—	—	—	„ Peek.
16	...	+	+	—	—	„ Kasauli.	„	+	+	—	—	—	„ Richards.
17	...	+	+	—	—	„ Richards.	26	+	+	—	—	—	„ Kasauli.
18	...	+	+	—	—	„ Kasauli.	„	+	+	—	—	—	„ Peek.
19	...	+	+	—	—	„ Richards.	„	+	+	—	—	—	„ Richards.
20	...	+	+	—	—	„ Kasauli.	27	+	+	—	—	—	„ Kasauli.
21	...	+	+	—	—	„ Richards.	„	+	+	—	—	—	„ Peek.
22	...	+	+	—	—	„ Kasauli.	28	+	+	—	—	—	„ Richards.
23	...	+	+	—	—	„ Richards.	„	+	+	—	—	—	„ Kasauli.
24	...	+	+	—	—	„ Kasauli.	29	+	+	—	—	—	„ Peek.
25	...	+	+	—	—	„ Richards.	„	+	+	—	—	—	„ Richards.
26	...	+	+	—	—	„ Kasauli.	„	+	+	—	—	—	„ Kasauli.
27	...	+	+	—	—	„ Richards.	„	+	+	—	—	—	„ Peek.
28	...	+	+	—	—	„ Kasauli.	„	+	+	—	—	—	„ Richards.
29	...	+	+	—	—	„ Richards.	„	+	+	—	—	—	„ Kasauli.
30	...	+	+	—	—	„ Kasauli.	„	+	+	—	—	—	„ Peek.
31	...	+	+	—	—	„ Richards.	„	+	+	—	—	—	„ Richards.
32	...	+	+	—	—	„ Kasauli.	„	+	+	—	—	—	„ Kasauli.
33	...	+	+	—	—	„ Richards.	„	+	+	—	—	—	„ Peek.
34	...	+	+	—	—	„ Kasauli.	„	+	+	—	—	—	„ Richards.
35	...	+	+	—	—	„ Richards.	„	+	+	—	—	—	„ Kasauli.
36	...	+	+	—	—	„ Kasauli.	„	+	+	—	—	—	„ Peek.
37	...	+	+	—	—	„ Richards.	„	+	+	—	—	—	„ Richards.
38	...	+	+	—	—	„ Kasauli.	„	+	+	—	—	—	„ Kasauli.
39	...	+	+	—	—	„ Richards.	„	+	+	—	—	—	„ Peek.
40	...	+	+	—	—	„ Kasauli.	„	+	+	—	—	—	„ Richards.
41	...	+	+	—	—	„ Richards.	„	+	+	—	—	—	„ Kasauli.
42	...	+	+	—	—	„ Kasauli.	„	+	+	—	—	—	„ Peek.
43	...	+	+	—	—	„ Richards.	„	+	+	—	—	—	„ Richards.
44	...	+	+	—	—	„ Kasauli.	„	+	+	—	—	—	„ Kasauli.
45	...	+	+	—	—	„ Richards.	„	+	+	—	—	—	„ Peek.
46	...	+	+	—	—	„ Kasauli.	„	+	+	—	—	—	„ Richards.
47	...	+	+	—	—	„ Richards.	„	+	+	—	—	—	„ Kasauli.
48	...	+	+	—	—	„ Kasauli.	„	+	+	—	—	—	„ Peek.
49	...	+	+	—	—	„ Richards.	„	+	+	—	—	—	„ Richards.
50	...	+	+	—	—	„ Kasauli.	„	+	+	—	—	—	„ Kasauli.
51	...	+	+	—	—	„ Richards.	„	+	+	—	—	—	„ Peek.
52	...	+	+	—	—	„ Kasauli.	„	+	+	—	—	—	„ Richards.
53	...	+	+	—	—	„ Richards.	„	+	+	—	—	—	„ Kasauli.
54	...	+	+	—	—	„ Kasauli.	„	+	+	—	—	—	„ Peek.
55	...	+	+	—	—	„ Richards.	„	+	+	—	—	—	„ Richards.
56	...	+	+	—	—	„ Kasauli.	„	+	+	—	—	—	„ Kasauli.
57	...	+	+	—	—	„ Richards.	„	+	+	—	—	—	„ Peek.
58	...	+	+	—	—	„ Kasauli.	„	+	+	—	—	—	„ Richards.
59	...	+	+	—	—	„ Richards.	„	+	+	—	—	—	„ Kasauli.
60	...	+	+	—	—	„ Kasauli.	„	+	+	—	—	—	„ Peek.
61	...	+	+	—	—	„ Richards.	„	+	+	—	—	—	„ Richards.
62	...	+	+	—	—	„ Kasauli.	„	+	+	—	—	—	„ Kasauli.
63	...	+	+	—	—	„ Richards.	„	+	+	—	—	—	„ Peek.
64	...	+	+	—	—	„ Kasauli.	„	+	+	—	—	—	„ Richards.
65	...	+	+	—	—	„ Richards.	„	+	+	—	—	—	„ Kasauli.
66	...	+	+	—	—	„ Kasauli.	„	+	+	—	—	—	„ Peek.
67	...	+	+	—	—	„ Richards.	„	+	+	—	—	—	„ Richards.
68	...	+	+	—	—	„ Kasauli.	„	+	+	—	—	—	„ Kasauli.
69	...	+	+	—	—	„ Richards.	„	+	+	—	—	—	„ Peek.
70	...	+	+	—	—	„ Kasauli.	„	+	+	—	—	—	„ Richards.
71	...	+	+	—	—	„ Richards.	„	+	+	—	—	—	„ Kasauli.
72	...	+	+	—	—	„ Kasauli.	„	+	+	—	—	—	„ Peek.
73	...	+	+	—	—	„ Richards.	„	+	+	—	—	—	„ Richards.
74	...	+	+	—	—	„ Kasauli.	„	+	+	—	—	—	„ Kasauli.
75	...	+	+	—	—	„ Richards.	„	+	+	—	—	—	„ Peek.
76	...	+	+	—	—	„ Kasauli.	„	+	+	—	—	—	„ Richards.
77	...	+	+	—	—	„ Richards.	„	+	+	—	—	—	„ Kasauli.
78	...	+	+	—	—	„ Kasauli.	„	+	+	—	—	—	„ Peek.
79	...	+	+	—	—	„ Richards.	„	+	+	—	—	—	„ Richards.
80	...	+	+	—	—	„ Kasauli.	„	+	+	—	—	—	„ Kasauli.
81	...	+	+	—	—	„ Richards.	„	+	+	—	—	—	„ Peek.
82	...	+	+	—	—	„ Kasauli.	„	+	+	—	—	—	„ Richards.
83	...	+	+	—	—	„ Richards.	„	+	+	—	—	—	„ Kasauli.
84	...	+	+	—	—	„ Kasauli.	„	+	+	—	—	—	„ Peek.
85	...	+	+	—	—	„ Richards.	„	+	+	—	—	—	„ Richards.
86	...	+	+	—	—	„ Kasauli.	„	+	+	—	—	—	„ Kasauli.
87	...	+	+	—	—	„ Richards.	„	+	+	—	—	—	„ Peek.
88	...	+	+	—	—	„ Kasauli.	„	+	+	—	—	—	„ Richards.
89	...	+	+	—	—	„ Richards.	„	+	+	—	—	—	„ Kasauli.
90	...	+	+	—	—	„ Kasauli.	„	+	+	—	—	—	„ Peek.
91	...	+	+	—	—	„ Richards.	„	+	+	—	—	—	„ Richards.
92	...	+	+	—	—	„ Kasauli.	„	+	+	—	—	—	„ Kasauli.
93	...	+	+	—	—	„ Richards.	„	+	+	—	—	—	„ Peek.
94	...	+	+	—	—	„ Kasauli.	„	+	+	—	—	—	„ Richards.
95	...	+	+	—	—	„ Richards.	„	+	+	—	—	—	„ Kasauli.
96	...	+	+	—	—	„ Kasauli.	„	+	+	—	—	—	„ Peek.
97	...	+	+	—	—	„ Richards.	„	+	+	—	—	—	„ Richards.
98	...	+	+	—	—	„ Kasauli.	„	+	+	—	—	—	„ Kasauli.
99	...	+	+	—	—	„ Richards.	„	+	+	—	—	—	„ Peek.
100	...	+	+	—	—	„ Kasauli.	„	+	+	—	—	—	„ Richards.

TABLE III.—SHOWING SOME COMPARATIVE SEDIMENTING EFFECTS OF COW'S SERA ON BACILLI OF THE PARATYPHOID GROUP (LIVING CULTURES OF TWENTY-FOUR HOURS). FEBRUARY.

Serial Number	<i>B. typhosus</i>						<i>B. paratyphosus</i> (A)						<i>B. paratyphosus</i> (B)						Remarks	
	Hang- ing drop 1 an hour. Dilution		Wright's tubes 20 hours. Dilution				Hang- ing drop 1 an hour. Dilution		Wright's tubes 20 hours. Dilution				Hang- ing drop 1 an hour. Dilution		Wright's tubes 20 hours. Dilution					
	10	20	10	20	40	80	10	20	10	20	40	80	10	20	10	20	40	80		160
1	...	...	+	+	T	-	-	...	...	+	-	-	-	...	...	+	+	-	-	B.T. Meerut.
2	...	...	+	+	-	-	-	...	...	+	-	-	-	...	...	+	+	-	-	" "
3	...	...	+	+	T	-	-	...	...	+	-	-	-	...	...	+	+	T	-	" "
4	...	...	+	+	I	-	-	...	...	+	+	-	-	...	...	+	+	-	-	" "
5	...	...	+	+	-	-	-	...	...	+	-	-	-	...	...	+	-	T	-	" "
6	...	...	+	+	I	-	-	...	...	T	-	-	-	...	...	+	+	I	-	" Kasauli.
7	...	...	+	+	T	-	-	...	...	+	-	I	-	...	...	+	+	I	-	" "
8	...	...	+	+	-	T	-	...	...	+	+	I	-	...	...	+	+	-	-	" "
9	...	...	+	+	I	+	-	...	...	+	+	-	-	...	...	+	+	I	T	" Meerut.
10	...	...	+	+	I	-	-	...	...	+	+	-	-	...	...	+	+	+	-	" "
11	+	...	+	+	I	-	-	+	...	T	-	-	-	...	...	+	I	T	-	" Kasauli.
12	+	...	+	+	I	-	-	...	...	+	T	-	-	...	...	+	+	I	-	" "
13	...	...	+	+	-	-	-	...	...	+	I	T	-	...	...	+	+	I	-	" "
14	...	...	-	I	T	T	-	...	...	+	+	-	T	...	...	+	+	-	T	" Richards.
15	...	...	+	+	I	+	-	...	...	+	+	+	+	...	...	+	+	+	-	" " Shera.
16	...	...	+	+	-	-	-	...	...	+	+	+	-	...	...	+	+	-	-	" "
17	...	...	+	-	-	I	-	...	...	+	-	-	-	...	...	+	-	T	-	" Lahore.
18	...	...	+	+	+	-	-	...	...	+	+	-	-	...	...	+	+	+	-	" "

+ = complete sedimentation.      - = no sedimentation.

I = incomplete sedimentation.      ... = not tested.

T = trace of sedimentation.

## FOURTH SERIES. (See Table IV.)

In this series are shown the results of the examination of a few calves, the idea being to find out whether the effects obtained with 1 to 10 dilution represented the normal sedimentation of cows' sera with *B. typhosus*.

Quite young calves show some reaction. There are, however, more negatives among calves than among grown-up animals.

TABLE IV.—SHOWING REACTION OF THE SERA OF YOUNG CALVES WITH THE TYPHOID FEVER BACILLUS, IN SEDIMENTATION TUBES AND HANGING DROP (LIVING BROTH CULTURES OF 24 HOURS GROWTH). FEBRUARY—MARCH.

Serial number	<i>Bacillus typhosus</i>					Remarks	Serial number	<i>Bacillus typhosus</i>					Remarks
	Dilution							Dilution					
	10	20	40	80	160			10	20	40	80	160	
1	—	—	—	—	—	Age of calf, 7 days.	13	—	—	—	—	—	Age 7 weeks.
	T	T					„	—	...	...	...	...	Ditto, hanging drop.
2	+	+	—	—	—	Age 10 weeks.		T	T	T			
3	—	—	—	—	—	Ditto.	14	+	+	+	—	—	Age 2 months.
4	—	—	—	—	—	Age 9 days.		I					
5	—	—	—	—	—	Age 11 weeks.	„	+	...	...	...	...	Ditto, hanging drop.
6	—	—	—	—	—	Age 4½ weeks.	15	—	—	—	—	—	Age 4 months.
„	—	—	...	...	...	Ditto, hanging drop, ½ hour.	„	—	...	...	...	...	Ditto, hanging drop.
7	—	—	—	—	—	Age 11 weeks.	16	—	—	—	—	—	Age 3 months.
„	T	—	...	...	...	Ditto, hanging drop.	„	—	...	...	...	...	Ditto, hanging drop.
8	—	—	—	—	—	Age 5 weeks.	17	—	—	—	—	—	Age 2 months.
9	—	—	—	—	—	Age 17 days.	„	—	...	...	...	...	Ditto, hanging drop.
„	—	—	...	...	...	Ditto, hanging drop.		I	I	I	T		
10	—	—	—	—	—	Age 3 weeks.	18	+	+	+	+	—	Age 3 months.
„	—	...	...	...	...	Ditto, hanging drop.	„	I					
11	—	—	—	—	—	Age 11½ weeks.	„	+	...	...	...	...	Ditto, hanging drop.
„	—	—	...	...	...	Ditto, hanging drop.	19	—	—	—	—	—	Age 4 months.
12	—	—	—	—	—	Age 3½ weeks.	„	—	...	...	...	...	Ditto, hanging drop.
„	—	...	...	...	...	Ditto, hanging drop.	20	—	—	—	—	—	Age 10 weeks.
							„	—	...	...	...	...	Ditto, hanging drop.

+ = complete sedimentation.      — = no sedimentation.

I = incomplete sedimentation.      ... = not tested.

+ = trace of sedimentation.



## GENERAL REMARKS.

It is possible that all the sedimentation effects afore-noted are associated reactions consequent on the operations of an unknown micro-organism which affects the serum of the cow.

Cows' sera give marked sedimentation results with a laboratory strain of *B. coli*, thus, for example :—

					I	T	
1.	10,	20,	40	+	80	+	160
					I	+	
2.	10,	20,	+	40	80,	160	+
					I	+	
3.	10,	20,	40	+	80,	160	+
					I	+	

These three gave  
also considerable  
reaction with  
B.T. Kasauli.

A marked reaction to *B. coli* is also present in young calves.

In examining the bile of 106 cows a few strains of bacilli of a typhoid-like character were met with, but none of them gave any reaction with the specific serum of *B. typhosus*.

## OUTBREAK OF FOOD POISONING AFTER A CHRISTMAS DINNER.

By MAJOR C. E. P. FOWLER.  
*Royal Army Medical Corps.*

THE following short account of illness produced after partaking of a certain meal may be of some interest, although it differs in no way from many other outbreaks previously recorded. For permission to publish the details, I am indebted to the kindness of Inspector-General Lilly, R.N., for a description of the clinical symptoms to Staff-Surgeon Daw, R.N., and for an account of the primary symptoms and diet table to Staff-Surgeon Hall, R.N.

On Christmas day sixty-four men employed in the Dockyard, Gibraltar, and living in a mess, sat down to mid-day dinner and partook of the various articles of food enumerated on the accompanying table.

Within about seventy hours twenty-five of these men had been admitted to hospital, and others had suffered from slight symptoms, though not sufficiently severe to compel them to lie up entirely. The onset of illness varied in length of time from three to seventy hours, and was chiefly characterized by colic, vomiting, diarrhœa, headache, pains in the limbs, fever, and marked depression.

The intensity of the poisoning varied from a mere passing nausea and slight looseness of the bowels to an acute diarrhœa and collapse, followed by death in one case. About six patients suffered severely, their illness, in an acute form, lasting some five or six days. One striking characteristic of the illness was the proneness to relapses of intestinal irritation after apparent complete recovery.

On making an investigation as to the causation of this illness, suspicion at once fell on the geese which had been consumed at the Christmas dinner. These and new potatoes are the only factors common to all the patients, as can be seen by looking at the table. It will be noticed that pork entered into the meals of all the patients on this same day with the exception of four, and attention was at once directed to this article, it being well known that the majority of such outbreaks are caused by the consumption of some part of the pig. No such connection, however,

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could be traced in this instance. Six geese were consumed at the meal. They had been imported from England in cold storage, plucked but not drawn. The mess manager stated that they were all in good condition, and no complaints were made as to their palatability, although one or two patients stated, after the subsequent events, that they did not like the look or taste of the flesh. The employment of any sausage meat, as stuffing, was denied by the cook. An interesting fact elicited subsequently was that the remainder of the geese was curried for breakfast on the 26th, and giblet soup was made from the necks, ribs, &c., and served on the 26th and 27th. This might account for the late onset of symptoms in some of the patients.

*The Cause of the Outbreak.*—An investigation, both chemically and bacteriologically, was carried out by Mr. Abrines and myself.

The first material received by us was the viscera of the patient who succumbed on the 28th. This consisted of the stomach and portion of intestine, with the contents of these organs. A chemical examination failed to reveal any mineral or other poison.

From the contents of the stomach and intestine and from blood drippings of the above was isolated the *Bacillus paratyphosus* B of Schottmüller. The organism must have been present in very great numbers, as no difficulty whatever was experienced in its isolation. Guinea-pigs injected with material from the contents of these organs, and with blood drippings, died or were killed *in extremis* within thirty hours of the injection. The same organism was recovered in pure culture from the heart's blood and internal organs of these animals. From this result there could be little doubt that the patient had died from a powerful dose of the *B. paratyphosus* B, and it was therefore probable that this organism had been the cause of illness amongst the other victims.

As regards the *post-mortem* examination of this case, Staff-Surgeon Daw notes "there was a recent universal pleurisy and peritonitis. Signs of an intense gastro-enteritis were present, and the intestines contained a greenish-coloured fluid of an aromatic odour."

Various articles of food were examined by us, but most unfortunately not a scrap of goose had been left unconsumed, and therefore no search for the incriminated bacillus in this article of food could be carried out. A portion of pork was received on the 29th, but it was in a very deteriorated condition, and no organism of the above class could be isolated. The pork, even though putrid, would probably have yielded the organism had it

Case	Dec. 25. Break- fast, pork chops	Dec. 25. Dinner, Ox-tail soup	Dec. 25. Dinner, fish- fried bream	Dec. 25. Dinner, roast goose	Dec. 25. Dinner, silver- side of beef	Dec. 25. Dinner, new pots	Dec. 25. Dinner, green peas (tinned)	Dec. 25. Dinner, cauli- flower	Dec. 25. Dinner, pump- kin pie	Dec. 25. Dinner, mince pies	Dec. 25. Dinner, beer	Dec. 25. Dinner, lemon- ade	Dec. 25. Break- fast, curried goose	Dec. 26. Dinner, giblet soup from goose	Dec. 26. Dinner, roast duck	Dec. 26. Dinner, roast pork	Dec. 27. Dinner, giblet soup from goose	Dec. 27. Dinner, roast pork	Onset of symp- toms
1	+		+	+	+	+	+						+	No record, but probably most partook of this soup	+			+	28th
2	+		+	+	+	+	+								+				27th
3	+		+	+	+	+	+								+				26th
4	+		+	+	+	+	+	+	+						+				27th
*5	+		+	+	+	+	+	+	+	+	+				+				25th
6	+		+	+	+	+	+								+				28th
7	+		+	+	+	+	+								+				25th
8	+		+	+	+	+	+								+				26th
9	+		+	+	+	+	+	+	+						+				26th
10	+		+	+	+	+	+								+				26th
11	+		+	+	+	+	+								+				28th
12	+		+	+	+	+	+								+				27th
*13	+		+	+	+	+	+	+	+						+				26th
*14	+		+	+	+	+	+	+	+	+	+				+				25th
15	+		+	+	+	+	+								+				26th
16	+		+	+	+	+	+								+				26th
17	+		+	+	+	+	+								+				26th
18	+		+	+	+	+	+								+				26th
19	+		+	+	+	+	+								+				26th
20	+		+	+	+	+	+								+				25th
21	+		+	+	+	+	+								+				26th
22	+		+	+	+	+	+								+				26th
23	+		+	+	+	+	+								+				26th
*24	+		+	+	+	+	+								+				28th
25	+		+	+	+	+	+								+				25th

\* Numbers starred were guests at dinner on 25th only.

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been originally present. The tinned peas were sterile and in good condition, containing a small quantity only of copper sulphate.

Blood for cultural purposes was drawn from three patients but the result was negative. The fæces of four patients were examined, but the *B. paratyphosus* was not isolated. The above two examinations were conducted from material at second hand, and the opportunity of recovering the organism was not favourable, so that a negative result is really of no value. Blood serum from four of the severer cases agglutinated the *B. paratyphosus* isolated from the patient who died, up to a dilution of 1 in 50 and 1 in 100, showing clearly that they had suffered from an attack of the same organism.

There appears to be little doubt that the geese were the cause of the outbreak, although actual proof of this was impossible.

In what manner the birds were affected is difficult to say. It is probable that two or three out of the six had suffered from some disease before slaughter, and being undrawn the bacilli had multiplied, invaded the flesh, and formed their toxin, which would account for the acute onset in several of the cases. The carcasses being undrawn, it is difficult to imagine that they could have become infected with the organism after slaughter, although a contamination of food after preparation is perhaps the most common cause of such outbreaks.

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# NOTES ON THE LAWS AND USAGES OF WAR, SO FAR AS THEY RELATE TO THE TREATMENT OF THE SICK, WOUNDED, AND DEAD.<sup>1</sup>

By BREVET-COLONEL J. E. EDMONDS, R.E., General Staff,  
AND  
LIEUTENANT-COLONEL W. G. MACPHERSON, C.M.G.,  
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(1) THE treatment of the sick and wounded of armies, the privileges of the *personnel* charged with their care, the special immunities of the establishments and buildings in which they are attended, and the obligations with regard to the dead are dealt with in the International "Convention for the amelioration of the condition of the Wounded and Sick in Armies in the Field" of July 6th, 1906, generally called the "Geneva Convention."

## NOTE.

The original Convention of August 22nd, 1864, still holds good between Powers which were signatories of it and have not ratified or adhered to the later Convention. (See Art. 31 of the 1906 Convention.)

(2) The first and most important obligation is that sick and wounded persons belonging to or officially attached to armies must be respected and taken care of by the belligerent in whose power they may be without distinction of nationality.

## NOTE.

Geneva Convention, Art. 1 (para. 1).

(3) As this obligation might prove too onerous for a victor left in possession of a battlefield covered with the wounded not only of his own but also of the enemy's army, it has been agreed that a belligerent who is compelled to abandon sick or wounded to his foe must, so far as military exigencies permit, leave behind with them a portion of his medical *personnel* to take care of them, and the necessary material.

## NOTE.

Geneva Convention, Art. 1 (para. 2).

(4) There is no obligation to tend inhabitants or other persons not officially attached to armies who may have been wounded by chance, or accident, as a result of the hostilities in progress.

## NOTE.

The absence of any provision for the care of such persons has been regarded as a weak point in the Geneva Convention. During the Russo-Japanese War

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<sup>1</sup> Draft of a proposed section of the chapter in the "Manual of Military Law" on the Laws and Usages of War. Published by permission of the Chief of the General Staff.

both at Liao-yang and Mukden, the number of inhabitants—men, women and children—who were injured was very considerable. It is desirable that the principles of the Convention should be applied to such cases, although they are not specifically mentioned in it.

(5) Sick and wounded who are captured are prisoners of war ; they have no privileges different from those of unwounded and healthy prisoners beyond that of proper medical attendance : in particular they have no right to claim exchange or release because they are unfit for active military service. Exchanges or releases, however, may be made, or sick and wounded may be handed over to a neutral State, by mutual agreement between commanders.

NOTE.

Geneva Convention, Art. 2.

(6) After an engagement the commander in possession of the field must take measures to have search made for the wounded and to protect them against acts of pillage and maltreatment.

NOTE.

Geneva Convention, Art. 3.

(7) Measures must also be taken to punish very severely any such acts whether committed by persons subject to military law or by civilians.

NOTE.

Geneva Convention, Arts. 3 and 28. Although Great Britain signed and ratified the Convention with reserve of Art. 28 (which binds the signatory Governments to undertake the legislation necessary for the purpose), as it was not possible to commit Parliament to any particular course, there is no doubt that the required amendments of existing laws will in the course of time be approved. Commanding officers can meantime deal with offenders as marauders.

(8) A nominal roll of all wounded and sick who have been collected must be sent as early as possible to the authorities of the country or army to which they belong. The proper channel for sending this information to the enemy is the Prisoners of War Bureau.

NOTE.

Geneva Convention, Art. 4 (para. 2).

For details of the Bureau, *see* Art. 14 of the Rules annexed to the Hague Convention, No. iv. of 1907, respecting the Laws and Customs of War on land.

(9) Under Article 5 of the Geneva Convention of 1864 inhabitants who assisted the wounded could claim to be treated as neutrals, and those who took wounded into their houses were exempted from having troops quartered on them, as well as from part of the contributions of war. These privileges were not continued by the

Convention of 1906, for it was found that so far from ameliorating the condition of the wounded they had had the effect of encouraging the inhabitants to withdraw wounded men from proper medical attendance and to move them when they had best been undisturbed.

## NOTE.

The article in the old Convention had also led to more serious abuses; inhabitants took wounded under their charge not only in order to protect their homes but to save from capture members of their family and others who were hidden in the house; in some cases these persons acted the part of wounded men.

(10) To soften the apparent harshness of this change it has been agreed that if a competent military authority finds it necessary to appeal to the charitable zeal of the inhabitants, he should grant to those who respond to his call special protection and such immunities as are possible; but he must secure that any assistance that is rendered is given under military supervision. As a rule, however, the collection and removal of wounded are best performed by requisitioned rather than by voluntary labour, for it can be more easily regulated and controlled. Wherever there is plenty of voluntary labour there must also be abundance of local resources available for requisition, so that no wrong is done to the wounded by restricting voluntary help on the part of the local inhabitants.

## NOTE.

Geneva Convention, Art. 5.

(11) *Personnel*.—In order that the sick and wounded may receive proper attention with as little disturbance as possible, all the units and establishments of the medical service, whether mobile or fixed, and their *personnel* and army chaplains, must be protected and respected in all circumstances by the belligerent forces; and the *personnel*, if it falls into the hands of the enemy, must not be held as prisoners of war. There is, however, no just cause for complaint of the violation of the Convention if in the execution of their duty members of the medical *personnel* and army chaplains are accidentally killed or wounded; they are only protected from deliberate attack.

## NOTE.

Geneva Convention, Arts. 6 and 9.

The words "neutral," "neutrality," and "neutralised," which were used in the 1864 Convention in connection with the medical *personnel*, are not employed in the 1906 Convention, by which the *personnel* is only entitled to be "respected and protected."



(12) To obtain the above privileges the *personnel* must be engaged exclusively in the collection, transport, and treatment of the wounded and sick, or in the administration of the units and establishments.

## NOTE.

Geneva Convention, Art. 9. Drivers of the Army Service Corps who are on the establishment of field ambulances and thus "exclusively engaged" on the transport of sick and wounded are entitled to protection under this Article. The fact that they are "exclusively engaged" is indicated by the wearing of the Red Cross brassard referred to in para. (37) below.

(13) The privileges accorded naturally cease if medical units and establishments are made use of to commit acts harmful to the enemy: for instance, to shelter combatants, to conceal guns, to carry on espionage, or if the *personnel* take part in a combat.

Certain acts referred to in the following paragraphs, which in the past were considered to be of a harmful nature,\* do not now, however, deprive a medical unit of the protection guaranteed by the Convention.

## NOTE.

Geneva Convention, Art. 7.

Members of the medical *personnel* who take part in a combat (and instances of their doing so have occurred, through excitement, or through a medical officer taking command in the absence or on account of the disablement of other officers) should remove the Red Cross badge referred to in para. (41). Otherwise, if captured their conduct may be made the subject of enquiry as an abuse of the Emblem under Art. 23 of the Rules annexed to the Hague Convention, No. iv. of 1907, respecting the Laws and Customs of War on Land. Permission to resume the badge should usually be accorded if it is asked for.

\* *e.g.*, in the South African War.

(14) It is expressly permitted that the medical *personnel* and medical orderlies may be armed and may use their arms for their own defence, or for that of the patients under their charge, against marauders and such like.

## NOTE.

Geneva Convention, Art. 8 (1).

(15) In some armies it is the custom to use trained soldiers as medical orderlies, while in others it is not; it is therefore expressly permitted that a piquet or sentinels taken from a combatant army may be used as a guard to a medical unit; but this guard must be furnished with an authority in due form,\* so as to ensure that the privileges of the guard of a medical unit, which are, while it is so employed, identically the same as those of the medical *personnel*, are not obtained improperly.

## NOTE.

Geneva Convention, Art. 8 (2) and Art. 9 (para. 2).

\* *i.e.*, a written statement signed by a responsible authority. The members of such a guard need not wear the badge referred to in para. 41.

(16) The fact that the arms and ammunition belonging to wounded men are found in a medical unit or hospital must not be construed to constitute an act harmful to the enemy; but every endeavour should be made to hand over such articles to the proper department as early as possible.

## NOTE.

Geneva Convention, Art. 8 (3).

(17) *Voluntary Aid Societies*.—Under certain conditions the *personnel* of Voluntary Aid Societies, which may be employed in the units and establishments of armies, is assimilated to, and placed on the same footing as, that of the Army Medical Service.

## NOTE.

Voluntary Aid Societies are popularly called Red Cross Societies.

(18) These conditions are that the Societies may be duly recognised and authorised by their Governments, that the names of the Societies must be notified to the enemy before any of their *personnel* is employed, and that the *personnel* must be subject to military law.

## NOTE.

Geneva Convention, Art. 10.

(19) So many irregularities and even acts of hostility have been committed in past wars by members of Voluntary Aid Societies that commanders should always take considerable care to ensure that all the above conditions have been complied with before permitting such persons to assist the medical service.

(20) The offers of assistance from the Voluntary Aid Societies of neutral States may be accepted, provided that the Societies obtain the consent of their own Government before offering their services and the authorisation of the belligerent Government which they wish to assist, and the latter Government notifies the fact of the authorisation to its adversary before making any use of them. In these circumstances the *personnel* of the medical units of Voluntary Aid Societies of neutral States must be granted all the privileges accorded to the Voluntary Aid Societies of the belligerent concerned. It is not necessary to obtain the consent of the adversary to utilise their services.

## NOTE.

Geneva Convention, Art. 11.

(21) *Captured Personnel*.—Although the *personnel* of medical units and establishments may not be treated as prisoners of war, yet it is not free to act or move without let or hindrance should it fall into the hands of the enemy. If called upon it must continue to carry on its duties under his directions, attending to such sick and wounded as require its services. Only when its assistance is no longer indispensable must it be sent back to its own army or its own country.

NOTE.

Geneva Convention, Art. 12.

(22) Thus the medical *personnel* of a force which capitulates may be detained to attend to the sick and wounded included in the surrender, and may be sent back gradually.

(23) Further, it is not left to the captured *personnel* to choose the time or route of its return, which is settled by the captor and must depend on military exigencies.

NOTE.

Geneva Convention, Art. 12. This clause was introduced into the Convention of 1906 to justify the usual practice in war. Under the Convention of 1864 captured *personnel* could, and did, demand to be sent back at once to the outposts of its own army. The inconvenience of this from a military point of view was so serious that the request was rarely complied with. Thus, during the South African War members of the medical *personnel* captured by the forces of the Republics were at once returned *vid* Delagoa Bay, and in the Russo-Japanese War some captured by the Japanese were handed over to the Russian Consul at Chefoo.

(24) The *personnel* on being returned is entitled to take with it such effects, instruments, arms, and horses as are the private property of its members.

NOTE.

Geneva Convention, Art. 12 (para. 3).

(25) In interpreting the above obligations it must be borne in mind that they are designed to secure that members of medical units shall not be in a position to take back useful information to their army; they are not meant to afford a loophole for depriving the enemy of the services of his medical *personnel* for an indefinite length of time.

(26) The fact that they may be detained and not permitted to return when and how they wish is sufficient penalty to prevent members of the medical *personnel* and medical units proceeding anywhere that they please in a theatre of war to collect, succour, or remove wounded and sick. If they persist in approaching when their presence is not desired, and refuse to halt when summoned to stop, it would be lawful to fire on them.

NOTE.

Nothing in the Geneva Convention gives medical units immunity from search. A Red Cross train or any other unit may therefore, just like a ship, be summoned to halt by firing a shot across its course.

(27) While members of the enemy's medical *personnel* are in his hands, a belligerent must grant them the same allowances and the same pay as are given to persons holding the same rank and status in his own army.

NOTE.

Geneva Convention, Art. 18.

(28) Although all the medical *personnel* must be released, in case of capture a distinction is drawn between the treatment of the material of mobile medical units, of fixed medical establishments accommodated in buildings, and of convoys for the evacuation of sick and wounded.

NOTE.

That is to say, those which are intended to accompany armies into the field (Geneva Convention, Art. 6).

Under this term are included,—besides the usual wheeled vehicles,—railway trains and boats used in internal navigation, which are specially fitted up for removing the sick and wounded, as well as any material belonging to the medical service for fitting up ordinary vehicles, trains, and boats. Geneva Convention, Art. 17 (2).

(29) Mobile medical units must be released complete with their material, including their teams, whether their means of transport and drivers belong to the army or are requisitioned. The conditions of release are the same as those laid down for the medical *personnel*, and so far as possible the *personnel* and material should be restored at the same time. They should not indeed be separated unless the circumstances are such that the return of the *personnel* is feasible; but delay must occur on account of physical or other difficulties before the material can be sent off.

NOTE.

Geneva Convention, Art. 14.

(30) A belligerent is, however, permitted to use the material in captured mobile medical units for the treatment of the sick and wounded of his own army, or those of the enemy's army who are in his power.

NOTE.

Geneva Convention, Art. 14.

(31) There is no obligation to provide teams to facilitate the return of the material should a captured unit have lost all or part of its own animals by casualties, but, if military exigencies permit,

for the sake of the sick and wounded every assistance should be rendered.

(32) The buildings of fixed medical establishments, hospitals, and depôts remain in the power of the captor, for from their nature they cannot be sent back to the enemy. They may not, however, be diverted from their purpose so long as they are necessary for the wounded and sick, unless in case of urgent military necessity, and only then provided arrangements are previously made for the welfare of the wounded and sick found in them.

## NOTE.

Geneva Convention, Art. 15.

(33) As a hospital or other fixed medical establishment would be useless without its material, this follows the fate of the buildings and becomes the property of the captor.

## NOTE.

Geneva Convention, Art. 15.

(34) Convoys used for evacuating sick and wounded must be treated in the same way as mobile medical units—that is, their *personnel* and material must be restored, subject to the following special provisions:—

(a) A belligerent intercepting a convoy may, if military exigencies demand, break it up and take the military vehicles in it (other than those of the medical service, which must be restored) with their teams. (See Para. 29.) He may also take and use, subject to the general laws of war, any requisitioned transport with it, including railway material and boats. He may also, as circumstances require, detain, requisition the labour of, or release any civilian *personnel* accompanying it.

(b) If he thus breaks up a convoy he must take charge of the sick and wounded in it. They are, as previously stated, liable to be made prisoners of war.

(c) He must treat as if it were medical *personnel* the whole of the military *personnel* detailed for the purpose of transport or guard of the convoy, provided it is furnished with an authority in due form.

## NOTE.

Geneva Convention, Art. 17. The *personnel* or guard referred to under (c) above need not wear the Red Cross Badge referred to in para. 41.

(35) Army medical material found elsewhere than in mobile medical units, fixed medical establishments, or convoys of evacuation, is liable to capture.

(36) The material belonging to Voluntary Aid Societies which are admitted to the privileges of the Geneva Convention is not completely assimilated to the material of the Army Medical Service, but in all circumstances must be regarded as private property; but whether found in a mobile medical unit, or in a convoy of evacuation, or in a fixed medical establishment, or captured anywhere in the theatre of war, it can always be requisitioned, and in this case, unless it is paid for in cash, a receipt must be given for it.

## NOTE.

Geneva Convention, Art. 16. No exception is made as regards the material in mobile medical units, which, if it belongs to the medical service and not to a Voluntary Aid Society, must be returned (Art. 14). See paras. 28 and 29. M. Renault, the *Rapporteur* of the *Comité de rédaction* of the text of the Convention, however, holds the opposite view and considers that Art. 16 does not override Art. 14. No decision was, however, given on the matter by the Conference, at which M. Renault's report was neither read nor discussed.

The difficulties of applying this clause will be great, for in some armies, notably the Austro-Hungarian, the Red Cross Societies provide a considerable proportion of the transport and other material of the regular field medical units (See Note to Section 42). Although not so stated in the Convention, the medical material of Voluntary Aid Societies should only be requisitioned for the needs of the medical service.

(37) *The Emblem*.—The mark which has been adopted to indicate the medical service of armies is a red cross on a white ground.\* This sign, by the provisions of the Geneva Convention, must not be used except to protect and indicate the medical units and establishments and the *personnel* and material accorded privileges by the Geneva Convention.

## NOTE.

Geneva Convention, Arts. 18, 23, and 27. Arts. 23 and 27, which forbid the use of the Red Cross emblem except to indicate the Army Medical Service, have not yet been signed and ratified by Great Britain. These articles, therefore, would not be valid in the case of a war between Great Britain and any other Power which has accepted the whole Convention. At present there is no municipal law in Great Britain to prevent the use of the Red Cross on white ground as a trade mark, a merchandise mark, or as a badge of a sisterhood or friendly society, or by any individual who chooses to do so, although in practically all other civilised countries laws to the effect are on the Statute Book. In order to secure the rights and privileges conferred by the Convention for the medical service, if legislation has not previously been obtained, it will be advisable in war to issue the necessary prohibitions and provide penalties under martial law or by proclamation, and to inform the enemy of this action.

\* Turkey, however, uses a Red Crescent, and Persia a Red Sun.

(38) In no case can the sign be recognised unless it is used with the permission of competent military authority. The permission is

signified either by a written authorisation, or by an official stamp on the sign.

NOTE.

Geneva Convention, Arts. 19, 20, and 21.

(39) Medical units and establishments must hoist the Red Cross flag. It must be accompanied by the national flag of the belligerent to whom the unit or establishment belongs, unless the unit falls into the hands of the enemy; in which situation the Red Cross flag only will be flown.

NOTE.

Geneva Convention, Art. 21. There is no indication how the two flags are to be associated. In most armies the two flags are flown on separate poles which are sometimes crossed. When both flags are hoisted on the same pole, it is desirable to fly the Red Cross uppermost.

(40) The medical units belonging to neutral countries which have been authorised to afford their services under conditions already mentioned are not permitted to fly their own national flag, but must fly the flag of the belligerent to whose armies they are attached; and they must, in other respects, conform to the instructions in the last paragraph.

NOTE.

Geneva Convention, Art. 22.

(41) The persons protected by the Geneva Convention,\* in order to secure the privileges conferred by it, must wear fixed permanently to the left arm an armlet (brassard) with the Red Cross on a white ground, delivered and stamped by competent military authority. Such persons must, if they do not wear a military uniform, be in possession of a certificate of identity.

NOTE.

Geneva Convention, Art. 23. There is no fixed form for certificates of identity. The use of certificates may lead to frauds unless there are marks on them by which the bearer can be recognised as the rightful owner. A certificate without such mark of recognition must be carefully scrutinized and steps taken to verify the rights of the bearer to be in possession of it. Finger-prints, photographs, signatures, are the most suitable recognition marks; but there may be difficulty as regards entering finger-print records or photographs; and in some countries signatures may not always be obtainable. There should, however, be no difficulty in noting distinguishable marks, such as scars on the face, loss of fingers or portions of fingers, &c., and the apparent age, height, colour of eyes and hair. Efforts are being made to obtain some definite international understanding with regard to the details which should be noted on a certificate of identity.

\* That is to say, those engaged exclusively in the collection, transport, and treatment of the wounded and the sick, in the administration of medical units and establishments and the *personnel* of Voluntary Aid Societies of the belligerents and neutrals who fulfil the conditions laid down in paras. 17 to 20.

(42) The material of the medical service must, in order to obtain the benefits under this Convention, be marked with the Red Cross on a white ground.

NOTE.

If the material is marked with the Geneva Cross only it cannot be accepted as the private property belonging to a Voluntary Aid Society, as this is the distinctive mark of the medical service of armies (Geneva Convention, Arts. 18 and 19). To obtain the extra privileges referred to in para. 36 the material of Voluntary Aid Societies should be marked, in addition to the Geneva Cross, with the name of the Society or some other means of identification.

(43) Cases with regard to the treatment of sick and wounded which have not been specifically provided for or mentioned in this section must be dealt with in conformity with the general principles enunciated in it.

NOTE.

See Geneva Convention, Art. 26.

(44) *The Dead*.—The dead must be protected against pillage and maltreatment.

NOTE.

Geneva Convention, Art. 3.

(45) The military identification marks or tokens found on the dead must be sent to the authorities of the army or country to which they belong as early as possible.

NOTE.

Geneva Convention, Art. 4. The Prisoners of War Bureau is the proper channel for the transmission. See note to para. 8.

(46) Before the dead are buried or cremated they must be carefully examined to ensure that life is extinct.

NOTE.

Geneva Convention, Art. 3. There is, however, no obligation to bury or cremate them.

(47) The articles of personal use, valuables, letters, &c., found on a field of battle or left by wounded or sick who die in medical establishments or units must be collected and transmitted to the persons interested through the authorities of their own country.

NOTE.

Geneva Convention, Art. 4.



## Clinical and other Notes.

### A CASE OF ENTERIC FEVER TREATED WITH VACCINE.

BY CAPTAIN J. C. KENNEDY.

*Royal Army Medical Corps.*

PRIVATE G., R.A.M.C., was admitted to Millbank Hospital on February 1st, 1909, with a temperature of 103·4° F. and complaining of headache, pains all over, and generally feeling "out of sorts."

*History.*—Employed as assistant in the Vaccine Department, Royal Army Medical College; lives in the barracks at Millbank, but gets week-end passes to visit his people near Chatham. Present illness started on January 27th, when he felt depressed, lost his appetite, and had slight fits of shivering.

On admission to hospital it was found that his tongue was foul and rather dry, the spleen was enlarged and could be felt at the costal margin on inspiration. The abdomen was soft and was not tender or painful on pressure. There was no history of diarrhoea, but the bowels had been irregular for the last few days. He was in an excitable and highly strung condition. There were no cardiac or respiratory symptoms.

On the following day (February 2nd) there was some tenderness in the iliac fossæ, and the administration of an enema gave practically no result. Major Grattan drew off 1 cc. of blood from the median basilic vein into bile, and in two days recovered the *Bacillus typhosus*. Widal's reaction was complete in 1—10, and incomplete in 1—20 dilution. For the temperature, pulse, and respirations *vide* the chart.

Next day the nervous symptoms became aggravated and the patient was very restless and inclined to be troublesome, especially towards night. At the same time he suffered from pain and retention of urine, though it was not found necessary to pass a catheter.

On February 4th (eighth day of illness) some spots were present, and there was slight distension of the abdomen. The patient was at times delirious, shouting out and crying. Such a condition in this early stage of the disease boded no good, and it was felt by Lieutenant-Colonel Simpson and all who saw him that he would be an exceedingly anxious case. On this day the result of the blood culture was proved positive, and it was resolved to treat with vaccine. At 6 p.m. the temperature was 103·8° F., and there was incontinence of urine. At 7 p.m. 50 million killed *B. typhosus* (stock vaccine) were injected into the upper arm. He had a fairly good night after this and passed urine normally at 2 a.m.

February 5th.—Temperature at 6 a.m. had fallen to 101° F., and did not rise above 102·4° F. all day. Patient was not so troublesome, had incontinence once, and slept heavily at night. There was a slight local reaction at the seat of inoculation.

February 6th.—At 6 a.m. temperature  $100.8^{\circ}$  F. and incontinence of urine. During the morning patient slept on and off and in the intervals was sensible. At 2 p.m. the temperature rose to  $102^{\circ}$  F., and nervous symptoms again became troublesome. At 6 p.m. temperature was  $103.8^{\circ}$  F., and there was incontinence during the evening. At 7 p.m. the second dose of vaccine was administered (again 50 million).

February 7th.—Urine passed normally at 9 a.m. and temperature fell to  $100.4^{\circ}$  F. Incontinence during the day and evening; temperature rose to  $103.2^{\circ}$  F. During the night he complained of pains in the abdomen and the lower limbs.

February 8th.—Distinctly better, tongue clearer, pulse-rate fell below 90.

February 9th.—Temperature normal at 6 a.m., but soon rose to  $102^{\circ}$  F., where it remained most of the night.

February 10th.—At 6 a.m. temperature  $99.2^{\circ}$  F. and at 10 a.m.  $100^{\circ}$  F. It looked as if the beneficial effect of the last dose of vaccine had worn off, and it was anticipated that the evening temperature would be higher than on the previous evening. Therefore, a third dose (50 million) was given at 12 noon. The temperature was up in the evening, as anticipated, and reached  $103^{\circ}$  F., but next morning was subnormal ( $97^{\circ}$  F.).

The subsequent course of the illness is sufficiently indicated by the chart. A fourth dose of vaccine (50 million) was administered on February 12, and it was noted that in the twenty-four hours following the last inoculation micturition was more frequent than at any other period of the illness, and from this date was performed voluntarily.

The patient made a very rapid and uninterrupted recovery, and suffered from no complication, with the exception of some atrophy of the deltoid and the infraspinatus muscles on the right side. He was constipated throughout, and the rectum was washed out every second or third day as necessity arose.

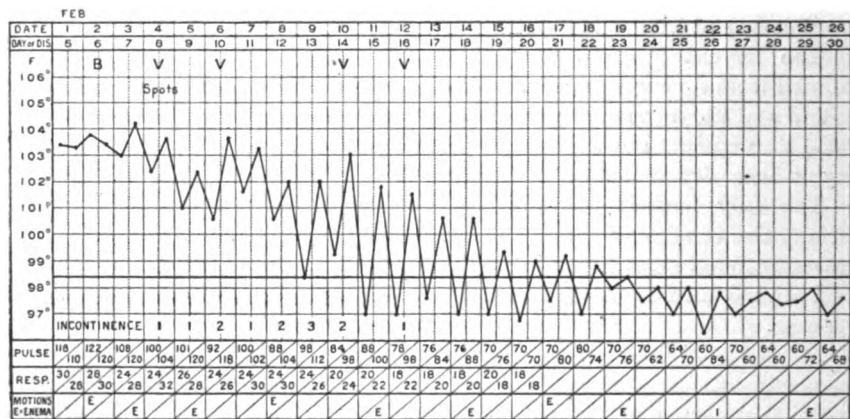
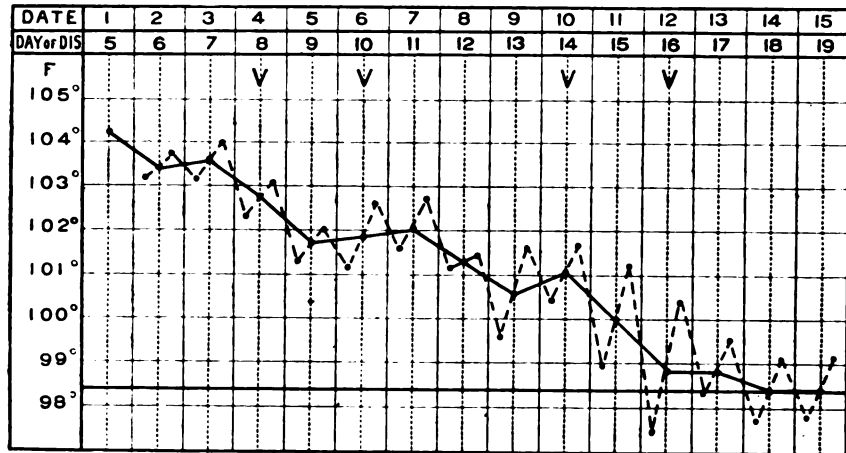
The only medicine administered by mouth was a stomachic and carminative consisting of ac. carbolic. and tinct. cardam. co., which I have generally found most useful in assisting to clean up the tongue.

I am indebted to Lieutenant-Colonel Simpson for permission to publish the case.

*Remarks.*—A study of the chart will, I fancy, make it evident that the satisfactory progress of the case was undoubtedly due to the administration of the vaccine. After each injection there is a fall in the temperature for two days, by which time the good effect appeared to be wearing off. The administration of the third dose was delayed intentionally in order to observe the temperature, and only when there was distinct evidence of a recrudescence was it given.

At the time it was resolved to treat this case with vaccine, I had not seen Captain Smallman's paper, which appeared in the February number of the Journal, and judging from former experience of vaccine treatment

I thought that small doses frequently repeated would give the best results. Therefore, the stock vaccine was diluted down till a dose containing only 50 million bacteria could be conveniently administered. The dose was the same on all four occasions, and it was intended to repeat it every second day; however, this intention was departed from, after the second dose, for the reason above stated.



In vaccine-therapy the question of dosage is a vital one, and I would enlarge on this point, especially in view of Captain Smallman's paper. Captain Smallman states that his best results were obtained with doses of 300 to 350 million bacteria or more, which produced a constitutional reaction (as evidenced by a considerable rise of temperature), and also that

four or five fulminating cases failed to react to the vaccine in the typical way, with doses varying from 100 to 356 million bacteria.

As I understand it, the theory of vaccine treatment of acute bacterial disease is to produce a local tissue reaction and a focus (or foci) of bacteriotropic substances, without or with as little constitutional disturbance as possible.

It would seem, therefore, that one's object should be to produce a series of these foci in different parts of the body and at frequent intervals of time, so that their effect may be gradual and cumulative.

In the case under discussion there was no appreciable constitutional disturbance after the injections, though there was quite a marked local reaction.

I fancy that the constitutional symptoms mean the absorption into the circulation of bacterial toxins, and are the evidence of a reaction or response on the part of the general immunising mechanism. But how are we to know in any given case of a systemic bacterial infection that this mechanism is not already being taxed to its utmost? There would seem to be evidence (and Wright's work goes to prove this) that if one can evoke a reaction by vaccination, the case will subsequently take a turn for the better. But why run the risk of not being able to evoke a reaction?

Chantemesse recognised this danger in the use of his serum, with which he got such good results, and laid it down that in severe cases the dose must be very small (half a drop). This is contrary to one's ideas of a serum, and it now seems proved that Chantemesse's serum is of the nature of a vaccine and produces an active immunisation instead of a passive.

My personal experience of vaccine-therapy in general has been insignificant, and in enteric fever in particular, but one case. All the same I may be permitted to enter here a plea for a more extended trial of the small doses repeated frequently by those who have the opportunity.

I hope shortly to publish a case of intractable Malta fever rapidly and permanently cured by a series of very small doses of vaccine, after a moderately large one, which elicited a slight response, had produced no beneficial result.

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#### NOTE ON A FULMINANT CASE OF CEREBROSPINAL FEVER.

By MAJOR D. J. COLLINS.

*Royal Army Medical Corps.*

THIS was a sporadic case of cerebrospinal fever of malignant or fulminant type which proved fatal within fifteen hours from the time of admission to hospital, and in which, but for the subsequent bacteriological examination, considerable difficulty would have been experienced in arriving at a true diagnosis.

Private X. was brought to the Military Hospital, Wynberg, at 3.30 p.m. on April 2nd, 1908. He had been on recruits' parade at 7 a.m. and 11 a.m. on the same day, and the instructor afterwards reported that he had noticed nothing unusual in the man's condition or appearance; his company officer, however, stated that he had noted the patient looking "paler than usual during the preceding ten days." He had eaten his dinner as usual, but about 2.30 p.m. he was sick, complained of pains in the head, and asked a comrade to take his duty. He then went to bed and after a little time complained of severe headache again; and as he was making a noise in the barrack-room a serjeant of his company ordered him to go to hospital, although the patient was unwilling to go there. When seen on admission he complained of acute pain at the back of the head and neck, and said he thought he had got a sun-stroke. The head was retracted, and the muscles of the back of the neck were somewhat rigid. The temperature was 102.2° F., and the pulse only 60 per minute, full and bounding. Erythematous patches were noticed on the trunk, arms, and legs; there were no ocular symptoms beyond photophobia, the patient covering his head to exclude the light. He vomited several times during the afternoon, and about 10 o'clock became very noisy, but on being told by the sister on night duty not to disturb the other patients he became quiet and continued so during the night; vomiting, however, persisted at intervals, and the temperature remained about 102° F. At six o'clock on the morning of April 3rd his condition was unchanged; the sister on duty observed nothing unusual in appearance, and there was nothing to indicate that a fatal issue was imminent. Shortly afterwards he developed Cheyne-Stokes breathing, with muscular twitchings of the arms and legs, and collapse set in, the patient dying at 6.30 a.m., exactly fifteen hours after admission.

The morbid changes noted at the *post-mortem* examination were small. The membranes of the brain and spinal cord were intensely congested; there was a fibrinous exudate at the base of the brain, and some similar fibrinous material was noted on the cortex and along the larger fissures. The cerebrospinal fluid was abundant and the lateral ventricles were distended with fluid. The other organs of the body presented no abnormal appearances. Bacteriological examination of the cerebrospinal fluid revealed a pure culture of the characteristic diplococcus of Weichselbaum. Regarding the previous history of the case the patient had been on detachment duty at Cape Town, and shortly before had undergone a term of three weeks' imprisonment in the civil prison. Enquiry of the prison surgeon and of the Medical Officer of Health at Cape Town, however, failed to disclose the occurrence of any recent cases of cerebrospinal fever in the Cape peninsula.

Some remarks of Professor von Lingelsheim on the subject of fulminant cerebrospinal fever are worth quoting, as bearing on this



case.<sup>1</sup> He says that in fulminant cases he has good reason to suppose that the principal rôle falls to cocci circulating in the blood. These extremely acute attacks are signalised clinically by their rapid course, which often lasts only a few hours, and which does not allow the distinct clinical picture with symptoms of meningitis to develop. From a pathological and anatomical point of view they are characterised by the apparently slight changes visible in the membranes of the brain and spinal cord, a condition which coincides with the scarcity of meningococci demonstrable in these situations. If in such cases the bacteriologist is not in a position to take material himself at the *post-mortem* examination and to submit it to investigation as soon as possible, the result is always negative. All material from such cases forwarded to von Lingelsheim's laboratory yielded no results. Pathological and bacteriological findings are therefore in the inverse ratio to the virulence and clinical course of the disease. Von Lingelsheim believes, from further experiences and from animal experiments, that in fulminant cases one has to deal with an acute intoxication with the toxin of a meningococcus, the result of the destruction of countless meningococci in the blood-stream. Bacteriologically, this occurrence is analogous to the intoxication produced in animal experiments by the introduction of the minimal lethal dose; an infection is developed which has a term set to it by bactericidal action, but this term comes too late to prevent death through the action of the toxins. The pathological findings in fulminant cases also point to a general bacterial intoxication, inasmuch as there are usually distinct changes in the lymphatic system, swelling of the lymph glands and intestinal follicles, and, in particular, hæmorrhages in the serous membranes and intestines. The not uncommon presence of other organisms in the exudate and in the deposits removed from the meninges, even in fresh *post-mortem* material, formerly led von Lingelsheim to believe in a mixed infection; he now, however, considers these organisms to be secondary intruders which easily obtain a footing towards the close of an intoxication process, brought about by the dissolution of the bacteria. Apparently greater weight will have to be given to the infection of the blood in cerebrospinal meningitis than has hitherto been the case.

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#### NOTES ON A CASE OF A DISEASE PREVALENT IN MALTA AND KNOWN THERE AS SPLENIC LEUCOCYTHÆMIA.

By CAPTAIN M. H. BABINGTON.

*Royal Army Medical Corps.*

THIS is the case of an English female child, aged 5½. The patient was attended throughout by a Maltese practitioner, who, at the beginning of the illness, thought it was a case of Malta fever, but as the serum

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<sup>1</sup> *Zeitschrift für Hygiene*, March, 1908, p. 465.

never gave the characteristic reaction, and as the enlargement of the spleen began to be pronounced, he and a consulting physician came to the conclusion that the disease was splenic leucocythæmia.

I was asked to see the child on November 28th, 1908, to confirm the diagnosis by an examination of the blood. I was unfortunately unable to make a count of the red corpuscles, as the bottle containing the diluting fluid was broken on the way to the patient's house, and the child died on the following day before I could make a second visit.

*Examination of the Blood.*—The blood as it flowed from the finger prick was pale in colour and looked thin and watery. Spread on a glass slide it made a very thin film almost difficult to see. Clotting took place in a sample collected in a blood capsule, a small firm clot and a large amount of serum being produced.

The white blood corpuscles =	..	..	..	..	2,200 per c.m.
Polynuclears	..	..	..	..	27 per cent.
Large mononuclears	..	..	..	..	18·4 "
Small	..	..	..	..	43·7 "
Eosinophiles	..	..	..	..	0·4 "
Myelocytes	..	..	..	..	10·4 "
Total	..	..	..	..	99·9 "
Number of whites differentiated	..	..	..	..	222

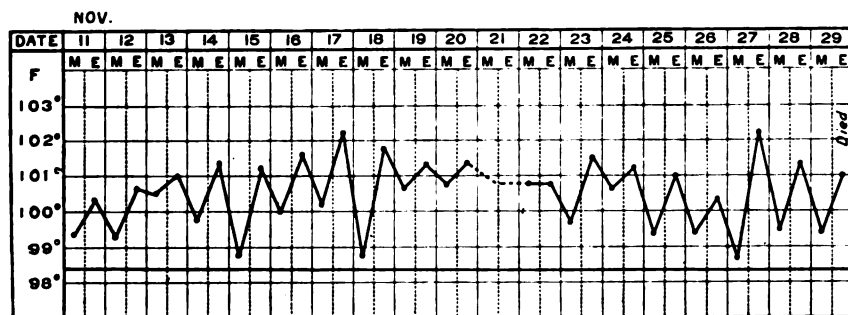
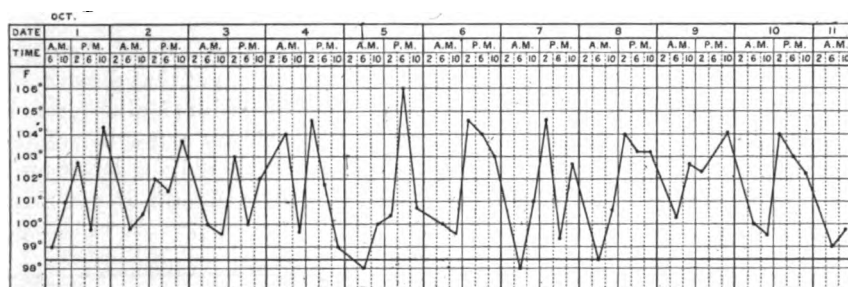
The stained blood film showed very few leucocytes. The red corpuscles were, if anything, larger than normal and stained well. Nucleated forms—five megaloblasts and sixteen normoblasts—were seen during the examination of 222 leucocytes. Poikilocytosis was present to a slight degree; polychromatophilia was not marked. Serum reaction with *Micrococcus melitensis* was negative.

*Previous Medical History.*—There was no definite history of rickets, but she was bottle-fed, did not cut her teeth until she was 16 months old; the molars were the first to appear. At Christmas, 1907, she had swollen glands in the neck, with a temperature of 102° F., but got quite well and returned to school in a few days. Pediculi cannot be definitely excluded as the cause of the adenitis. There was no suspicion of inherited syphilis.

*History of Present Illness.*—In July she was a little pale and run down, but this was attributed to the hot weather. In August she was seen by a general practitioner who found that she was feverish, and, suspecting Malta fever, had the blood examined twice for this disease, with a negative result.

After seven weeks in bed it was noted that the spleen was greatly enlarged. A diagnosis of splenic leucocythæmia was then made by a consultant, who based his opinion on the clinical aspect of the case, and did not make a cytological examination of the blood. The girth at the navel was 21 inches and increased later to 23 inches, but before death

it became reduced again to 21 inches. Pain was present over the spleen, at times severe, requiring for its relief the application of hot fomentations. There was no diarrhoea nor hæmorrhages from the bowel throughout the illness. There were three slight attacks of epistaxis before death took place. Itching of the skin was a troublesome symptom at times. The temperature for the first two months was markedly remittent or intermittent, rising to 104°, 105°, or even 106° F. A four-hourly chart shows that on many days there was a double rise. Towards the termination of the case the temperature kept to a lower level, seldom being above 102° F.



I saw the patient on November 28th, 1908; her condition was then as follows: Skin, lemon yellow tint; no subcutaneous hæmorrhages; girth of abdomen at navel 21 inches; ascites well marked; labia swollen with œdema. The outline of the anterior border of spleen could be seen on abdominal wall; the spleen was greatly enlarged, extending below umbilicus, and was painful on pressure. The liver was slightly enlarged. The tongue was broad, red at the centre, and pale yellow towards the edges; there was no furring. The legs and arms were wasted. Temperature was 101° F. On the 29th an attack of acute laryngitis developed and proved fatal on the 30th. A *post-mortem* examination was not allowed.



*Remarks.*—The symptoms in this case are similar to those of the disease described as ponos, occurring in Spezzia and Hydra, and to those of infantile kala-azar in Tunis and Sicily.

So far as I have heard the Leishman body has not yet been looked for in these cases in Malta, but I have no doubt that it will soon be found. Cases of this disease are rare in English children; I have met only this one in six months. Among the Maltese it is, however, very common. In the year 1907-08, if the deaths in children under 1 year are neglected, leucocythæmia is credited with causing 84·1 per 1,000 of deaths in children aged over 1 year and under 5. At this period of life it causes more deaths than any other disease, with the exceptions of bronchitis and enteritis.

As to the nature of these cases returned as leucocythæmia, there can be very little doubt that the majority are not instances of that disease.

The age incidence of this disease compared with Malta fever is interesting, in view of the theory which was held by a few before the discovery of the Leishman body, that kala-azar was only another form of Malta fever. The figures are from the Public Health Department returns for the financial year 1907-08.

Age .. ..	AGE AT DEATH																			Total
	Under 5					Over 5														
	Under 1	1	2	3	4	5	10	15	20	25	30	35	40	45	55	65	75	—		
Mediterranean fever	—	—	—	—	—	2	4	5	7	3	4	7	7	4	2	—	—	45		
Leucocythæmia	9	30	28	11	3	—	1	—	—	—	—	—	—	1	—	—	—	83		

It is possible that the disease may be conveyed by lice, which are frequently found in the hair of children during the age period when the disease is most prevalent.

#### A FATAL CASE OF KALA-AZAR.

BY LIEUTENANT-COLONEL L. W. SWABEY.

*Royal Army Medical Corps.*

As kala-azar is fortunately rare among British troops, the following case may prove of interest:—

Private W. J., 1st West Riding Regiment, aged 27. Total service, six years and two months, India two years and five months. Was admitted with gonorrhœa at Sitapur, January 28th, 1908, a few days after arrival from Ranikhet. He had fever on admission, and ten days later enteric

fever developed, a positive Widal reaction (1—50, one hour) being obtained. The disease ran a mild course and he was sent to the Enteric Fever Convalescent Dépôt at Naini Tal on April 23rd, 1908, and returned to Sitapur on August 6th, 1908. At the dépôt he was treated for five days in May for bronchitis and tonsillitis, but had no fever at that time. On August 25th, 1908, he was admitted to the Station Hospital, Sitapur, and came under my care; as a blood slide showed benign tertian parasites he was diagnosed malaria. Quinine was given hypodermically and by the mouth. The tongue was clean and the bowels regular. There was considerable splenic enlargement and frequent rigors. Quinine having no effect, methylene blue was given in  $1\frac{1}{2}$ -grain doses thrice daily. There was gradual wasting, but nothing at all urgent about the symptoms. On November 20th, 1908, the case was handed over to Captain J. McKenzie, R.A.M.C., and I give his notes *in extenso*.

November 22nd, 1908.—Temperature of an irregular intermittent type, with shivering and sweating. The spleen is palpable and descends below the costal margin to level of half inch above umbilicus. The nipple areolæ are very dark brown in colour, and the skin of the inguinal region is stained brown and mottled.

November 25th, 1908.—Temperature continues irregular and intermittent; severe rigors two and sometimes three times a day. During these rigors the patient feels intense cold and covers himself up with blankets. Heart and lungs healthy; liver not enlarged or tender; spleen enlarged, reaches to level of half inch above umbilicus, feels solid, is not tender, and moves very little on respiration. Urine specific gravity 1002, total quantity in twenty-four hours 64 ounces, no albumin, no sugar, no deposit. Bowels tend to be constipated, opened by *ol. ricini* and *enemata*. The four-hourly chart shows frequently a double rise in the twenty-four hours. A film of blood from the finger is thin and watery. Stained with Leishman's stain, a blood film shows great scarcity of leucocytes; even along the edges and at the ends leucocytes are extremely few and are mostly mononuclears. There are no malarial parasites (has had no quinine for three days).

November 30th, 1908.—Condition the same. Urine on 29th inst., 40 ounces, specific gravity 1010. No medicines given. Blood film same as before. No malarial parasites present.

December 2nd, 1908.—Condition much the same. Rigors at uncertain intervals, often more than one in a day. Temperature rose to 105° F. on November 30th.

December 4th, 1908.—Liver puncture performed this morning and a few drops of blood drawn up by syringe and spread on glass slides. Stained with Leishman's stain, this blood differs very little from the finger blood, except that the absence of leucocytes is less marked. Also a few Leishman bodies *were* found, two were lying in a pale blue matrix; their

macro- and micro-nuclei were fairly well marked. The case appears, therefore, to be one of kala-azar.

From December 11th marked improvement set in and patient got a good colour and became fatter. Temperature kept about normal. His period of comparative apyrexia continued until December 26th. The spleen has decreased slightly. He is getting iron and arsenic and red bone-marrow.

December 26th, 1908.—Handed over case to Lieutenant-Colonel Swabey, R.A.M.C.

December 28th, 1908.—Resumed charge of case from Captain J. McKenzie, who has reported his departure for England (time expired), Temperature last evening, 103° F.; this morning, 100° F. For some time past the temperature has been normal.

December 30th, 1908.—Temperature normal this morning. Doing well.

January 9th, 1909.—Has been doing very well since last entry, but for the past twenty-four hours has had dysentery. Enema, morph. hydrochlor.  $\frac{1}{2}$  grain. Milk, brandy and egg-flip ordered. His face has assumed a very dusky hue lately.

January 12th, 1909.—Dysentery still persists. Emaciation developed.

January 14th, 1909.—Dysentery continues. Enema as before.

January 19th, 1909.—Dysentery continues. Ipecac. sine emetine preceded by liq. opii sed.

January 21st, 1909.—Bone-marrow ordered. Frequent scanty stools, less blood. Patient in a very low state.

January 22nd, 1909.—Ordered mist. astringens every two hours. Complains of radiating pain over spleen. Hot fomentations.

January 23rd, 1909.—Very low, subnormal temperature. Diarrhoea less. Very slightly blood-stained fæces. Stimulant mixture every two hours.

January 24th, 1909.—Very low, occasional delirium.

January 25th, 1909.—Very bad night. Delirious; pulse fairly good. Complains of pain over spleen. Ordered veronal, one tablet.

January 26th, 1909.—Delirious. Temperature subnormal.

January 27th, 1909.—Temperature 98° F. Delirious; sinking fast.

January 28th, 1909.—Died at 10.15 p.m. yesterday.

#### POST-MORTEM EXAMINATION (FOURTEEN HOURS AFTER DEATH).

Extreme emaciation. *Rigor mortis* developed. Marked yellowish-brown pigmentation of face and forehead.

Thorax. Firm pleural adhesions on right side. Right lung—upper lobe pale slate colour, exuding frothy mucus on incision, lower lobe congested, weight 22 ounces. Left lung—no pleural adhesions on this side, upper lobe in much the same condition as the right, upper lobe showing evidence of bronchitis, lower lobe congested.

Heart, 8 ounces. Valves and structure normal.

Abdominal Cavity: Liver, 58 ounces; pale colour, otherwise normal. Spleen, 31 ounces; much enlarged, capsule stripped easily. Very congested and friable. Right kidney, 8 ounces; pale grey colour. Left kidney, 8 ounces; pale grey. Small intestines, pale grey colour. No ulcers or entozoa. Large intestine, no ulcers, but presented throughout its course a peculiar wash-leather appearance, or severe gangrenous condition.

MICROSCOPIC EXAMINATION BY LIEUTENANT CASEMENT, R.A.M.C.

Three smears of splenic pulp were prepared and stained with Leishman's stain. Numbers of Leishman bodies were demonstrated, one or two surrounded by a definite matrix. The macro- and micro-nuclei were well marked. Two smears of liver-pulp were examined and some Leishman bodies found, though not so numerous as in the spleen.

*Remarks.*—This case is of interest as it occurred out of the endemic area of Bengal and was contracted either at Naini Tal or at Sitapur, probably the former. The patient had been stationed for a year at Seelong, but only passed through Calcutta and was never stationed there. Quinine seemed to be literally useless, though he did well for a short time on quinine and arsenic, but he soon relapsed, and dysentery fatally terminated the case.

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PARATYPHOID SIMULATING MALTA FEVER.

By SURGEON-CAPTAIN R. SAMUT.

*King's Own Malta Regiment (Militia).*

THE close resemblance between paratyphoid fever and true enterica is firmly established, and it is only by means of careful bacteriological examination that the infecting agent can be determined in these diseases.<sup>1</sup> That a paratyphoid infection may so closely simulate Malta fever as to be identical with it in all its clinical manifestations, however, is not usually accepted. Secondary or mixed infection in Malta fever by members of the paracolon group, and notably by the *Bacillus paratyphosus* B, is not only possible but, as I have had occasion of ascertaining since writing in this Journal,<sup>2</sup> fairly common.

The following notes of cases, at present under treatment at the Central Hospital, Floriana, however, will prove that cases exist which, from their symptomatology, are as far removed from the usual picture of infections by the paracolon group as they are closely related to Malta fever, and

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<sup>1</sup> Coleman, *Medical News*, New York, July 29th, 1906; Conradi, *Beilage, Cent. f. Bakt.* (ref.), September 15th, 1906; Chevrel, *Thèse de Paris*, 210, 1906.

<sup>2</sup> "Paratyphoid Infection during the Course of Malta Fever," *JOURNAL OF THE ROYAL ARMY MEDICAL CORPS*, September, 1908, p. 302.

which, on careful bacteriological examination, yield evidence of paratyphoid infection.

(1) S. E., aged 16, admitted January 15th, 1909, suffering from headache, constipation, and anorexia, with a temperature of 103° F. He had been feeling ill for three weeks before admission, and often felt chilled in the evening. On examination there were signs of diffuse bronchitis; spleen much enlarged; pulse 110; tongue white and furred; no rose spots; no jaundice; urine normal. The temperature chart being typical of Malta fever, a sample of blood was sent to our clinical laboratory on February 2nd to confirm the diagnosis. This failed to react. It was retested on the 5th and again failed to give a positive reaction.

(2) G. M. S., aged 23, admitted January 19th, 1909, complaining of headache, constipation and vomiting. The temperature was 103° F.; the spleen was enlarged and the tongue furred. The patient was very pale and anæmic. There were no rose spots at any time; no jaundice; no albumin in the urine. The temperature chart showed a characteristic Malta fever undulation, and to confirm the diagnosis of this disease the blood was twice tested, but failed to react to the *Micrococcus melitensis* on each occasion. Despite the negative reaction to the agglutination test, the clinical features of both cases were so typical of Malta fever that they were diagnosed as such, and doubts cast on the agglutinating value of our cultures of the *M. melitensis*. It therefore became necessary to overhaul our cultures, and Professor C. Samut and myself set to work to test whether they were reliable. For this purpose the serum of a typical Mediterranean fever case, E. M., was taken as control, and an emulsion of *M. melitensis* having been made, we proceeded to test the serum of the three cases under consideration in the following manner:—

S. E.	G. M. S.	E. M.
Dilution, 1 in 20	Dilution, 1 in 20	Dilution, 1 in 200
negative	negative	positive

By this means the purity of our culture was established beyond a doubt. An emulsion of *B. paratyphosus* B was now made, and the experiment repeated on similar lines:—

S. E.	G. M. S.	E. M.
Dilution up to 150	Dilution up to 150	Dilution above 20
positive	positive	negative

Having obtained this result, our next step now was to endeavour to effect the recovery of *B. paratyphosus* B from the blood. To do this Conradi's ox-bile with peptone and glycerine and plating on Drigalski-Conradi medium and bile-salt lactose neutral red agar after eighteen hours' incubation at 37° C. was employed, but, in spite of careful manipulation, we were unable to recover any bacillus from the blood.

It would therefore appear that mild cases of paratyphoid fever may exist which reproduce the clinical picture of Mediterranean fever in all

its details. Such cases, while yielding the Widal reaction to *B. paratyphosus* B, do not react positively to *M. melitensis*, thus excluding the possibility of a mixed infection.

This being the case, I consider that a diagnosis of Malta fever is unwarranted in cases where the blood reaction is negative to *M. melitensis*, no matter how closely the clinical picture may resemble that disease. In all such cases a test for the *B. paratyphosus* B becomes necessary to exclude infection by this bacillus. Cases which are usually classified as Malta fever, in which the diagnosis is not based on the Widal reaction, or in which this test may have given negative results, should in future fall under the heading of paratyphoid fever, and by this means one may look forward to seeing a marked fall in the number of cases which are usually classed as Malta fever in our statistical returns.

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#### TURPENTINE SOAP.

BY CAPTAIN N. E. HARDING.

*Royal Army Medical Corps.*

THIS soap, the recipe for which I owe to the kindness of Mr. H. M. W. Gray, M.B., F.R.C.S.E., Surgeon to the Royal Infirmary, Aberdeen, will be found very useful I think to all who have to disinfect their hands frequently for any purpose, as it has all the advantages and none of the disadvantages of the proprietary ethereal soap, being non-irritating, cheap, and readily prepared, and non-evaporating. In using it it is best to take a little in the palm of the hand and rub it into the skin till nearly dry before taking up the nail-brush. Take two parts of soft soap and one of glycerine and boil together. Strain through muslin—an old handkerchief does very well—and when nearly cold add one part of turpentine and mix well. Keep in a wide-mouthed bottle.

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#### ON VACCINATION.

BY LIEUTENANT W. A. SPONG.

*Royal Army Medical Corps.*

THE article on vaccination by Captain Walton, R.A.M.C., in the April issue of the Journal is very interesting, and although I fully agree with him that vaccination should be treated as a serious operation, I am quite at variance with the technique used by him, and consider it open to many objections.

The objections are as follows :—

(1) Captain Walton requires three orderlies to carry out the sterilisation of the arm to be vaccinated. This is all very well when one can obtain the orderlies for the purpose, but in my short experience, I never could get more than one, and he was generally the orderly in charge of

the inspection hut. The establishment of hospitals is not so large that orderlies, *ad lib.*, can be spared for vaccination duty, and I am sure the majority of officers in charge of hospitals would not sanction three, when a lesser number is quite sufficient.

(2) The use of antiseptics, such as hyd. perchlor., on the arm, is, in my opinion, quite unnecessary. Vaccine organisms are easily killed, even by the mildest antiseptic, and in vaccinating we want to keep them alive, not kill them.

With regard to the cooling of the instruments in (1—20) carbolic, it is also quite unnecessary and injurious to the lymph.

In one station I was in the officer in charge of the hospital called on me for a report, asked for by the Aldershot Vaccine Institute, as to why there were so many failures during a certain month; the percentage of failures worked out at 15·38 per cent. On looking up the records I discovered I was not responsible, and on going into the technique I also discovered that my predecessor had cooled his instruments in (1—20) carbolic lotion, as recommended by Captain Walton, and naturally this was put down as the cause, as the lymph was quite active (proved beyond doubt).

Several of my failures I attributed to the use of boracic lint as a dressing, after vaccination had been done and the lymph had dried. Captain Walton uses cyanide gauze as a dressing, and according to his statistics has had only five failures during the year. In the face of that, coupled with my own view of boracic lint and other antiseptic dressings, I can only conclude that cyanide gauze is purely a coloured gauze with a fancy name, and has absolutely no antiseptic properties whatever. No doubt something must be wrong here.

A large proportion of officers have adopted the method of vaccinating below the elbow. It is certainly a very convenient place, and dressings are easily applied. I adopted this method, but after thirty vaccinations I gave it up, for the following reasons:—

(1) On account of the recruit pulling up his sleeve, desiring to view his "wounds" and show them to his comrades.

(2) When the lymph has "taken" the wounds become intolerably itchy, and no matter how strong a will a recruit may have he cannot refrain from scratching, and scratch he will, in spite of all orders—he pulls up his sleeves, scratches and tears, loosens the dressings, and infects the "wounds" which are placed to the best advantage for the purpose.

(3) A recruit's hands are seldom clean, much less sterile, and dirt permeates very quickly through the dressings, which in this case are situated much too near the hands and the opening of the sleeve.

(4) Vaccination of this site causes great stiffness of the flexor and extensor muscles of the forearm and mobility is affected.

(5) A "septic" arm, vaccinated on this site, is worse, for physiological reasons, than an arm vaccinated higher up.

I have stated my main objections to Captain Walton's technique, and now I will pass to my own experiences.

At York, between January 1st and May 19th, 1908, I vaccinated 318 cases, with the following results: 280 were successful (either modified or perfect), 38 were failures, and 22 were admitted to hospital for "big" arms. Between May 19th and January 7th, 1909, at Leeds, I vaccinated 102 cases, of which 81 were successful, 21 were failures (including 2 children), and 8 were admitted for "septic" arms. Between January 9th and February 24th, 1909, at Lichfield, 92 cases were done, of which 90 were successful, 2 failures, and no admissions to hospital. Total for one year and two months: 512 cases, 61 failures, 30 admissions to hospital.

These statistics are quite alarming when compared with Captain Walton's, but my excuses for so many cases of sepsis and failures are quite reasonable and justifiable.

The first series contain 38 failures and 22 admissions. The failures I account for by using iodoform gauze as a dressing, carbolic lotion as a cooler for the instruments, and acquired immunity, as every recruit that was brought before me, Militia or otherwise, was vaccinated if the medical history-sheet showed no entry.

The septic arms I account for, in the majority of instances, by dressings not having been applied, through an oversight. This happened in the first batch of recruits I did, owing to the men not going to the hospital to be dressed. The other cases were accounted for by infection when going from inspection hut to hospital, by dust getting on the wounds, and also recruits rubbing off the vaccine with dirty fingers.

The second series of cases shows 21 failures. I put these down entirely to using boracic lint as a dressing. The septic cases are accounted for by the dressings having slipped when the recruits were "sweated" on the barrack square, and the consequent infection by scratching, &c. (These cases were among the forearm vaccinations mentioned earlier.)

The third series of cases show a more or less perfect result, viz., only 2 failures out of 92 cases vaccinated. The failures in those two cases were due to acquired immunity—both recruits having been previously vaccinated in the Merchant Service a couple of years before.

Summing up the three series, it will be seen that there has been an enormous improvement, especially in the third series, from comparison with the first series. I attribute the successful results to the scheme I have now adopted and use invariably. It is as follows:—

*Operator and Orderly.*—Cleanse the hands thoroughly with soap and water and nail-brush.

*Site.*—The upper arm above and below the groove formed by the the deltoid, biceps, and other muscles, or, in other words, the "old" place.



The men parade before me three at a time with their coats off and sleeves rolled up. If one arm bears previous vaccination marks the other arm is chosen, and prepared as follows by the orderly: The arm is thoroughly scrubbed with soap and water and a nail-brush, dried with a clean towel (used only for the purpose), then rubbed over with a piece of wool soaked in spirits æther meth.

*Instruments.*—The instruments used are the ordinary "lancets" from the vaccination case. They are sterilised by heating in the flame of a spirit-lamp, and then cooled by dipping into cold sterile water. The arm is then scratched in three places, two marks above the groove and one below. The greatest care is taken not to draw blood. The marks are small and placed close together, so as to admit the use of a small dressing.

*Application of Lymph.*—The lymph is blown out on to one of the wounds by means of a patent vaccine blower, and spread over the marks by means of the flat part of the vaccinating instrument. The recruit is then sent to sit down on a form till the lymph dries, with strict injunctions not to touch his arm, and is kept under observation the whole time.

*Dressings.*—When twelve men have been vaccinated they are inspected, commencing with the first, and dressed as follows: A piece of plain lint is put over the wounds, covering them well, and strapped on by thin strips of either soap or rubber plaster above and below; the plaster used is according to what can be obtained. The men are then sent away with the injunction that if the dressing comes off they are to attend and have it renewed. Then the next twelve men are dressed, and so on.

*After-treatment.*—The men attend every morning till fit for duty; they are excused gymnasium, drill, all parades, and heavy duties for one week. This is marked on the roll. On attending on the second, third, and fifth mornings after the operation they get a dose of mist. alba, 1 oz. On the seventh day after operation the marks are inspected as to results, the wounds redressed with boracic lint, and duties are commenced one by one, until the end of the second week all the usual duty is performed.

The advantages of this technique, in my opinion, are manifold, viz.:—

(1) One orderly only is necessary—the N.C.O. in charge of the men calling out the names.

(2) The baring of the two arms allows inspection of previous marks without loss of time.

(3) The site is convenient. It is removed from the prying eyes of the inquisitive. Dressings are easily applied. It is as far as possible removed from extraneous infection. It cannot be so easily scratched; unfortunately it can be scratched, but not so violently, as the recruit must take his tunic off to get at it properly—this he generally does not

do owing to the trouble. The loss of mobility of the arm is not so marked or so great. It prevents the enlargement of certain chains of glands (as a general rule), the brunt being borne by the axillary glands. The dressings stay on more readily, as they are helped by the shirt and tunic, and the marks are on a comparatively non-fleshy part, and the dressings are not loosened by contracting and expanding muscles.

(4) No antiseptics (spirits æther meth. excepted) are used, and therefore in case of failure the causes are simplified, being due to either inactive lymph, immunity, or deficient inoculation.

(5) *Economy of Dressings.*—This is most necessary in these days of economy. When I first was posted to a military hospital I used dressings *ad lib.*—bandages, gauze, &c.—for vaccination, and I soon found myself called over the coals by the officer in charge on that account, when the dispenser complained of a shortage. And, further, profiting by my own experience as officer in charge of an out-station hospital, when finding myself with practically no dressings available towards the end of the half-year, and at a time when they were most required for serious cases in hospital, I realised that economy in dressings is absolutely essential. Bandages are expensive, each costing anything from 3d. upwards, and the supply limited, while plaster (except rubber), especially soap plaster, is comparatively cheap, and is equally efficacious for vaccinating purposes. Again, a clean towel is used for drying arms; it can be washed and used again, whereas wool cannot, and besides, wool is required for other things and need not be wasted.

(6) *The Use of Mist. Alba.*—When the lymph has taken there is a slight constitutional disturbance, usually marked by a temperature between 99° and 100·6° F., accompanied by the resulting “seediness” of the individual. This condition is benefited by a saline, and that is the reason it is given.

(7) *Excusal of Duties.*—The excusing of all duty for one week after vaccination does not do any harm to the training of a recruit. It can only do good, and besides it prevents N.C.O.'s “sweating” men in the gymnasium and on the square, when they are obviously unfit for severe duties. I refer to the constitutional effects of vaccination previously mentioned. My main objection to the continuance of duty after vaccination is that the exercises make men perspire, dirt gets from their clothing on to the moistened skin, on to dressings, and on to “wounds.” The result is septic infection and “big” arms. Even provided that there is no septic infection, the fact of exercise increases the constitutional disturbance, with consequent slackness of the individual, followed by the wrath of the N.C.O., and extra work to the unfortunate, and most probably in addition a “big” arm.

Recruits, according to Army Medical Service Regulations, ought to be vaccinated on the second day after joining the depôt or headquarters of their unit, and, if I remember rightly, Lieutenant-Colonel Firth,

R.A.M.C., in his recently published and very valuable book on "Military Hygiene" (which, unfortunately, I have not now by me to confirm my statement), is of opinion that for the first month a recruit should have practically nothing to do in the way of drills, until the good food, clothing, and general hygienic conditions of modern barrack life have built up his probably debilitated condition on enlisting. All medical officers who do recruiting duties constantly pass recruits who, although coming up to the necessary standards, are under the less "vital" weight standard, consequent on starvation in civil life. How many officers, I wonder, can recognise those same recruits three months afterwards, when they have had the condition improved by good food and exercises? If they do happen to recognise them, what an enormous improvement they will see (I speak from experience on the matter, short though it be)? Therefore, what is the objection to excusing a recruit from his duties for a week or two, till he recovers from the first test—vaccination?

As the subject of vaccination is a most important one, I would very much like to hear the experiences and views of other officers who may feel interested in the subject, as perhaps a combination of schemes may help to devolve some system whereby vaccination may be rendered a perfect success in every detail. I adopted my present technique about six months ago, and as it is yet only in its infancy it may be open to question, although the results so far have been perfect. If a definite technique can be established for the carrying out of vaccination, it would be of an enormous advantage to junior officers like myself, and other officers who are entrusted with vaccination. Perfect schemes for the routine treatment of scabies and venereal diseases, &c., have been devised, therefore why should not one be devised as a routine for vaccination operations?

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### THE COLLECTION AND TREATMENT OF WOUNDED CAVALRY SOLDIERS.

BY CAPTAIN H. G. ROCH.  
*Royal Army Medical Corps.*

LIEUTENANT-COLONEL MACPHERSON'S lecture on the above subject, published in the February number of the Journal, has suggested that possibly the method adopted in the mounted column to which I was attached during the latter stages of the South African War may not be entirely without interest.

It was found that if the stretchers were carried in a cart they were never at hand when required, so that this mode of transport was given up and pack mules were used instead.

A mule could easily keep up with the troops and carry two stretchers with a blanket rolled in each, a medical companion, or surgical haversack

and water-bottle, as well as four days' oats ; latterly a shirt, drawers, and pair of socks were also rolled up in each stretcher, as these were found to be so very useful when wounded had to be temporarily treated in farm-houses away from the rest of the column.

The stretchers were fixed on to pack saddles by the following very simple plan, all that was required being made by the saddler with the column. To an iron ring about  $2\frac{1}{2}$  inches in diameter were strongly sewn three leather straps, two short ones to buckle round the stretchers near the handles, and the third, rather longer, was punched with holes to buckle to an ordinary girth.

Four of these rings were required, one for each hook of the pack saddle, and between each pair a girth passed under the mule and was buckled to the third strap on each side, so that the stretchers balanced each other and were kept steady by the girths. The haversacks were hung by their slings over the four hooks on the pack saddle and were kept in place by a surcingle. By this means a stretcher, if required, could be taken off the animal very quickly and two could quite easily be removed at a short halt, the surcingle being passed through a loop on the pack saddle, so that it could not be lost when unbuckled.

One such mule, led by a mounted native and accompanied by a mounted medical orderly, was sent with each troop when they were acting independently, while the medical officer of the column (or unit) remained with the commanding officer, keeping with him another pack mule which carried the medical companion instead of a surgical haversack.

By this arrangement a stretcher and everything necessary to apply first aid was supplied and an orderly capable of deciding whether a wounded man should be sent back or carried to shelter, whether it was necessary or not to send for the Medical Officer and who knew where to find the Medical Officer, was in touch with each troop in action.

This, of course, does not do away with the difficulty of bearers, but in actual practice it was not found difficult to find one man to help the medical orderly to carry a stretcher to a farm or place of safety in case a severe injury necessitated its use ; a large proportion of the wounded were able to find their way back to the Medical Officer on horseback, after being attended to by the orderly.

If the Royal Army Medical Corps men attached for water duties were increased in number, and were all mounted, they could be attached to troops, and with a bandsman to lead a stretcher mule the gap between the fighting line and the light wagons of the Cavalry Field Ambulance would be filled up and probably a good deal of time would be saved in the collection and treatment of wounded cavalry men.

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## THE WAY TO SAVE LIFE.

THE DANISH SWIMMING AND LIFE-SAVING ASSOCIATION

BY SCHOOL-INSTRUCTOR HOLGER NIELSEN.

## (a) WHEN THE DROWNING MAN IS QUIET OR UNCONSCIOUS.

WHEN the drowning man is quiet or far gone he is turned on his back. The rescuer catches him with one hand on each side of the head and conveys him to shore, the rescuer swimming on his back. The drowning man's face should be held high above the water, and the rescuer should swim slowly with even movements (fig. A).

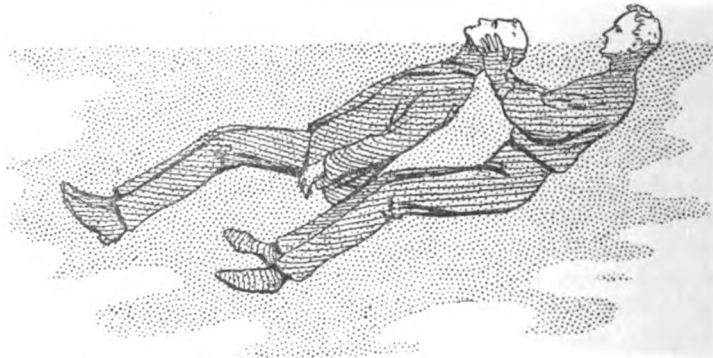


FIG. A.

If the man is unconscious he will best be saved by placing an arm under his chest and letting his neck rest on the shoulder. The rescuer works with his free hand as well as with his legs (fig. B).

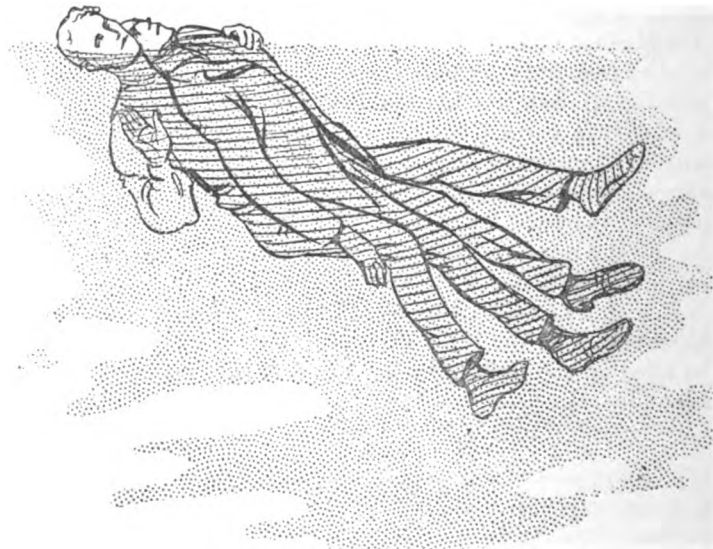


FIG. B.

**(b) WHEN THE DROWNING MAN IS VERY TROUBLESOME.**

When the man is wild with fright and kicking and trying to catch the rescuer, the latter must catch him from behind, thrusting his hands under the man's arm-pits and placing them on his chest; at the same time the man's arms are lifted towards the surface, which makes him float higher, and gives the rescuer a better grip. The man is carried ashore by the back stroke (fig. c).



FIG. C.

**(c) HOW THE RESCUER FREES HIMSELF FROM A DROWNING MAN'S CLUTCH.**

When the drowning man grips the wrists from above the rescuer should draw his arms together inwards and upwards over the man's arms, and then force them out sideways (fig. d).

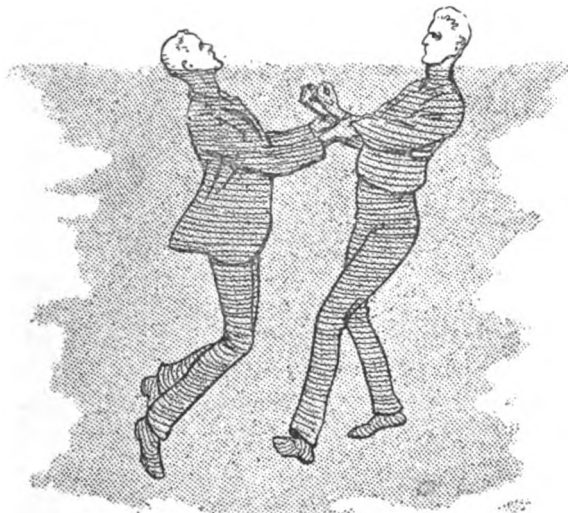
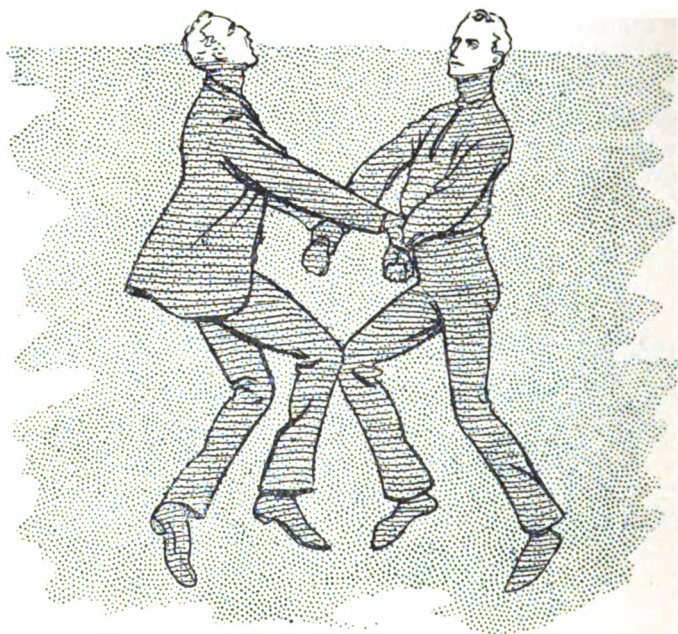
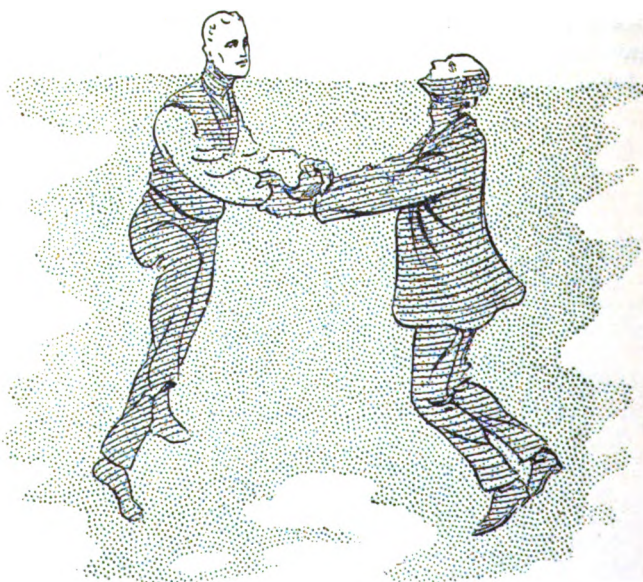


FIG. D.



**FIG. E.****FIG. F.**

If the drowning man grips the wrists from below the rescuer must swing his arms quickly in a circle inside the drowning man's, and then push them downwards and out sideways (fig. E).

In case of one hand or arm being gripped the rescuer frees himself by bending his arm (assisting with his free hand) in the line of the man's thumb (fig. F).

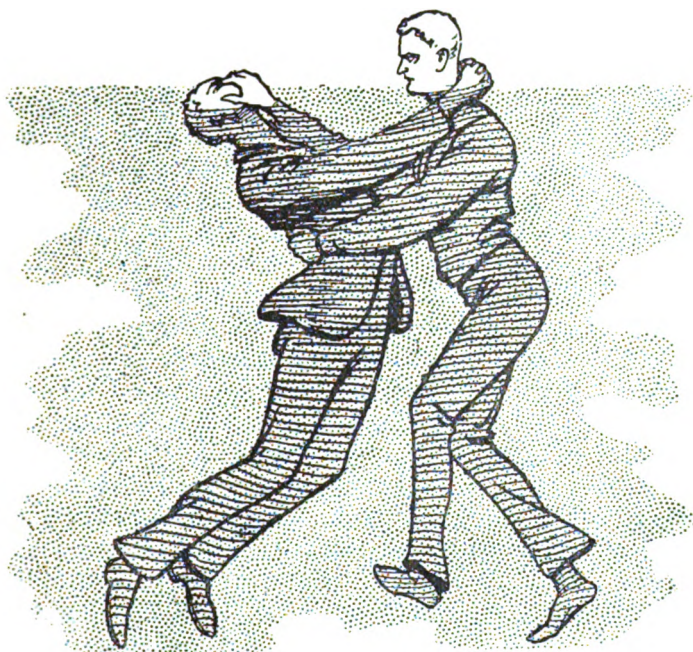


FIG. G.

In case the drowning man grips the neck or catches the arm or waist, the rescuer stoops over him quickly and seizes him with one arm round the waist just above the hips, drawing him nearer to him; and with the other arm—the hand being pressed against the subject's nose and mouth, the butt of one hand under the chin—pushes his head and upper part of the trunk backwards. Should the drowning man not release his grip at once the rescuer must bend one of his knees up against the lower part of the body, and pushing against this force the man away from him (fig. G).



## Echoes from the Past.

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THE following account of the examination of an Army Medical Officer as to his fitness for advancement in the Service, is of interest as contrasting the methods and standard of examination eighty years ago with those of the present day.

The Examinee, who was born in 1803, served an apprenticeship of six years to a medical man in Aberdeen, where he passed through the usual curriculum in Arts at Marischal College and attended lectures on Chemistry, Anatomy, Surgery and Midwifery.

He afterwards prosecuted his medical studies for a year in Edinburgh, and six months in London, at the Middlesex Hospital, becoming on April 15th, 1825, a member of the Royal College of Surgeons *in London*, as the English College was then designated. He was appointed Hospital Assistant in the Army by Commission dated May 19th, 1825, became Assistant-Surgeon of the 91st Foot in 1826, and was promoted to be Surgeon of the Cape Mounted Riflemen in 1841, retiring on the half-pay of that Regiment in 1850.

Sir Jacob Adolphus, the President of the Board which conducted the examination in Jamaica, served an apprenticeship of six years to a medical man in Spanish Town, Jamaica, to whom he acted as assistant for nearly two years longer. After this he attended St. Thomas's Hospital, London, as a regular pupil for eighteen months, and was appointed a Hospital Mate in the Army by Warrant dated October 2nd, 1795. He became Assistant-Surgeon of the 60th Foot in 1802, and on June 29th, 1809, was promoted to be Surgeon to the Forces. In 1816, on the recommendation of Sir James McGrigor, Director-General, and of Dr. Edmund Somers, Deputy-Inspector of Hospitals, he obtained the degree of M.D. from the Marischal College and University, University of Aberdeen, and in 1817 he became a member of the Royal College of Surgeons in London. In the same year he was granted brevet rank of Deputy-Inspector of Hospitals, and in 1827 he retired on half-pay as Inspector of Hospitals, and was created a Knight Bachelor, July 1st, 1840. He died at Cheltenham in 1845. Dr. James Weir, the senior Member of the Board, was educated in Edinburgh and became a licentiate of the Royal College of Surgeons of Edinburgh in 1811, and in the following year graduated M.D. at the University there. He was appointed Hospital

Mate in the Army, by Commission dated October 1st, 1812, and after passing through the grades of Assistant-Surgeon and Surgeon, was gazetted August 12th, 1819, to be a Physician to the Forces, a departmental designation which was afterwards altered into that of Assistant-Inspector of Hospitals. He was placed on half-pay in 1831, and died in 1835. Dr. Samuel Hill, the junior Member of the Board, served an apprenticeship of five years to his father, who was a surgeon at Portsea, and after a year's attendance at Middlesex Hospital became a member of the Royal College of Surgeons in London, April 1st, 1808. He was appointed Hospital Mate by Commission, March 22nd, 1810, and when employed in Edinburgh as an Assistant-Surgeon to the Forces, qualified for and obtained the degree of M.D. there in 1822. On February 19th, 1824, he was promoted to the rank of Surgeon to the Forces, and died when serving at Portsmouth, October 31st, 1830.

MINUTES OF THE EXAMINATION OF ASSISTANT-SURGEON  
WM. C. EDDIE, 91ST REGIMENT.

A passage from Gregory's *Conspectus Medicinæ Theoreticæ* was given to him to translate, which he did with facility, after which the following Questions were proposed; to these he gave the subjoined Answers:—

Q. How many lobes has the brain?

A. Six—two anterior, two middle, and two posterior lobes.

Q. How many has the cerebellum?

A. Two.

Q. How many cavities are there in the brain, and how are they called?

A. Four, ventricles. Sometimes a fifth is found, but it is in general indistinct.

Q. How many sinuses are there in the brain?

A. Seven, chiefly, namely, superior and inferior longitudinal sinuses, superior and inferior petrosal sinuses, two lateral, and the torcular herophili.

Q. How is the brain supplied with blood?

A. By the internal carotid and vertebral arteries.

Q. How is it returned thence?

A. By the sinuses into the internal jugulars.

Q. How many bones are there belonging to the head?

A. Eight—six proper, two common to it and the face.

Q. What are the diseases of the head or brain?

A. Phrenitis, apoplexy and mania.

Q. What is the structure of the heart ?

A. Muscular.

Q. How many cavities has it ?

A. Two auricles and two ventricles.

Q. Describe the circulation of the blood ?

A. The blood is brought from all parts of the body by the superior and inferior venæ cavæ into the right auricle, passes into the right ventricle, and then by the pulmonary arteries through the lungs, and is returned from them by the four pulmonary veins into the left auricle, thence it passes into the left ventricle to be propelled into the aorta and arteries throughout the body.

Q. What is the use of the blood ?

A. To nourish the body, generate heat and supply the secretions.

Q. What is the stomach ?

A. A muscular bag in shape like that of a bagpipe, to contain food and fit it for digestion.

Q. Where is it situated ?

A. In the epigastric region under the diaphragm.

Q. How is the stomach supplied with blood ?

A. By branches from the cœliac, the coronaria ventriculi, the right and left gastro-epiploic.

Q. How are the intestines divided ?

A. Into large and small.

Q. What are the small intestines named ?

A. Duodenum, jejunum, ileum.

Q. What are the large ?

A. The cæcum, colon, and rectum.

Q. Where is the process of digestion for the most part completed ?

A. In the duodenum and jejunum.

Q. What are the chief diseases of the stomach and intestines ?

A. Inflammation, dyspepsia, diarrhœas, dysentery, colica, cholera.

Q. What are the diagnostic symptoms between gastritis and enteritis ?

A. The seat of pain, the great anxiety, constant vomiting, especially when anything be taken into the stomach. Incessant thirst, excruciating pain, increased on pressure, will point out the seat and nature of the disease in gastritis.

Q. What is the treatment to be pursued in enteritis ?

A. Large and repeated bleedings, warm bath, fomentations, purging, enemata, purgatives after bleeding has been premised.

Q. What are the orders in Willan's "Classification of Diseases of the Skin" ?

A. Papulæ, squamæ, exanthemata, bullæ, pustulæ, vesiculæ, tuberculæ, maculæ.

Q. Give an example of a disease in each of these orders?

A. (1) Lichen, (2) lepra, (3) rubeola, (4) erysipelas, (5) variola, (6) varicella, (7) acne, (8) nævus.

Q. What are the boundaries of the thorax?

A. Sternum, ribs, spine, clavicle, and diaphragm.

Q. What is the membrane that lines it?

A. The pleura.

Q. What are the chief diseases of this cavity?

A. Pneumonia, catarrhus, dyspnœa, carditis, bronchitis, asthma, hydrothorax, angina pectoris, hæmoptysis.

Q. What are the diagnostic symptoms between asthma and angina pectoris?

A. In angina the sense of constriction of the chest extends to the left arm, the attack is for the most part sudden, and after, or while taking exercise, palpitations, pallid countenance, cold clammy partial sweats, sense of approaching death, relieved by an horizontal posture and perfect quiescence; no wheezing as in asthma.

Q. What is mercury?

A. A metal.

Q. Has it any action on the human system in that state?

A. No.

Q. What is the most active preparation of it?

A. The muriate.

Q. What is the chemical difference between it and the submuriate?

A. It contains more oxygen and hence more acid than the submuriate.

Q. What is opium?

A. A vegetable extract.

Q. From what plant is it extracted?

A. From the *Papaver somniferum*.

Q. From what part of the plant?

A. From the capsules.

Q. Where does it chiefly grow as an article of commerce?

A. In Turkey and Upper Egypt.

Q. Do you know the class and order of the Linnean System of Botany to which this plant belongs?

A. I know but little Botany. By the Board 13th Class Polyandria, 1st Order Monogynia.

Q. What is the dose of this medicine?

A. From 1 to 3 grains.

Q. How many grains of opium are contained in 10 grains of the pulvis ipecacuanæ compositus ?

A. One grain.

Q. What are the other ingredients and their proportions in the same quantity.

A. One grain of the radix ipecacuanæ and 8 of the sulphate of potass.

Q. What is jalap ?

A. A vegetable.

Q. What part of the plant is used in medicine ?

A. The root.

Q. Where does the plant grow ?

A. In Mexico, near Jalapa.

Q. What is the Botanic name of the plant ?

A. Convolvulus Jalapæ.

Q. Is there any other of the same genus similar in virtue to the last medicine ?

A. Scammony.

Q. Describe the liver ?

A. A large glandular body situated in the right hypochondrium under the ribs near the epigastrium composed of five lobes and kept in its position by means of processes of the peritoneum called ligaments.

Q. What is the use of the liver ?

A. To secrete the bile.

Signed { J. ADOLPHUS, M.D.,  
Inspector of Hospitals.  
JAMES WEIR, M.D.,  
Physician to the Forces.  
SAMUEL HILL, M.D.,  
Surgeon to the Forces.

Kingston,  
March 10th, 1827.



## Travel.

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### ALPINE TRAVEL—A RETROSPECT.

BY COLONEL J. M. BEAMISH.

*Retired Pay, late Royal Army Medical Corps.*

ALTHOUGH to some extent *autres temps autres mœurs* may rightly be prefaced to this latter-day account of an ascent of Mont Blanc in 1893, the writer is induced to record his experiences in August of that year, compiled from notes made at the time, from a knowledge that, till a railway or aviation inaugurates a new era, the difficulties of the undertaking must remain much the same as hitherto; the most notable difference—that of time occupied in its performance since the first ascents by Balmat and others in 1786-87—being attributable mainly to lack of experience in the past and improved aids to mountaineering in more recent times.

It is further hoped that, despite more modern, though perhaps less sporting, methods of ascent, interest may still be sustained in time-honoured pedestrian adventure, from the physical training which it encourages no less than the special enjoyment which it promotes.

I commence my narrative with the circumstances which led to my making the ascent of Mont Blanc. I arrived at Chamonix from Geneva, *viâ* Cluses and Sallanches, by rail and diligence, about 6 p.m. on August 24th, 1893, in good time for the *tâble d'hôte* dinner at the Hotel d'Angleterre. I had, on arrival, no intention whatever of climbing the great mountain, till, after dinner, the interest begot of a conversation between a party of three Frenchmen who had just returned from the Grands Mulets, after having accomplished the ascent of Mont Blanc the previous day, induced me to reconsider my situation, to sleep on the subject of an ascent, and see what another day might bring forth. The weather in the valley, as in our own islands, had, so I ascertained, been fine for months, and I was also informed that several ascents had been made during the previous month or six weeks. A change, however, seemed impending, and the forebodings of the weather were, on the whole, not favourable.

The morning of the 25th broke cloudy, but without rain; a dense fog enveloped Mont Blanc itself, extending, in a partial

degree, to the lower peaks surrounding it. I abandoned my idea of an ascent, and started, at 8.45 a.m., on foot, with a single guide, in a quite opposite direction, for Montanvert and the Mer de Glace, which was reached about 10.30, and, after a halt of twenty minutes—more or less—our descent to the valley was resumed by the Mauvais Pas, after crossing the Mer de Glace. The valley was soon reached, and while proceeding on the level road to Chamonix, I interrogated my guide as to the prospects of the weather and the possibility of gaining the Grands Mulets<sup>1</sup> the same afternoon. His verdict was favourable on both points, and he eagerly tendered his services, not, however, yet accepted, for the advance to Mont Blanc. We arrived at the hotel at 12.30 p.m., and by this time the fog had quite cleared off the mountains.

I immediately enquired at the Bureau des Guides as to the capabilities of my attendant guide for making an immediate ascent. The verdict was again favourable, and a resolution was formed to start at 2 p.m., leaving only an hour and a half to make all arrangements. The guide selected two comrades, and I set about putting some climbing kit together—a process in which I was materially aided by the hotel “boots,” a man of middle age who had ascended the mountain some eighteen years before. He got my boots (those which I usually wore) shod, and provided me with an ice-axe (an implement which, I believe, I had never seen, certainly never handled before), a Balaklava cap, two pairs of stockings, a pair of gaiters, coloured spectacles, and mittens. I wore an ordinary tweed knickerbocker suit and a flannel shirt of medium thickness. My three guides, or rather, two guides and a porter, were meanwhile making their preparations. I took only a chicken (cooked) and two small flasks of brandy from the hotel, as arrangements for catering were then, and I suppose are still, usually left to be completed at the Grands Mulets. Before starting, I had a substantial lunch, consisting of beefsteak, Munich beer, and cheese.

Our party of four, equipped in this extemporaneous fashion, started on foot from Chamonix as the clock was striking two. Following the right bank of the Arve for half an hour by the main road down the valley, and crossing the river by a bridge on our left, we commenced the ascent on a rough winding road through a pine-covered slope for the lower third of the distance, and afterwards through more open ground as far as Pierre Pointue (7,000 feet above sea-level), where we arrived soon after 4 p.m., and

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<sup>1</sup> Second stage to Mont Blanc and 10,000 feet above sea-level.

halted a few minutes. Feeling thirsty, I had a cup of milk in Seltzer water during the halt. Continuing our course over a rugged path between naked rocks on the eastern side of the glacier of Busson, we embarked on the ice an hour later, travelling some distance across the glacier without encountering any very formidable obstacle, till the increasing frequency and width of the crevasses made it advisable to rope ourselves together in the usual way. It soon became necessary to cross the larger crevasses on ladders, which were fixed in a few places for the convenience of wayfarers.

The difficulty or danger—not entirely absent, of course—in crossing by means of these ladders, which are of varying length (from 5 to 20 feet), need not be exaggerated. A much more present source of danger consisted in stepping over even a narrow crevasse on to a ledge, in places not more than a foot wide, along which it became necessary to walk a distance of 20 or 30 feet sometimes before reaching a crevasse at the other end, bridged or not, as the case may be. A steadiness of balance is essential under these conditions, all movements being in the erect position instead of on all fours, as is usual where a ladder is crossed. A false step in such a situation might endanger the lives of a whole party, who must be all on the ledge at the same time, with no other alternative than a yawning abyss on either side. Critical situations like this are, however, infrequent, and are, as a rule, successfully overcome, after which the ascent to the Grands Mulets, if more steep and snowed up in places than it is lower down the glacier, is entirely devoid of danger or risk, presuming favourable circumstances of weather. I may note that at this point of steeper ascent I suffered from temporary cramp of the extensor muscles of the right thigh immediately above the knee, doubtless due to a hard day's work and insufficient training in what was then, though not formerly, an unwonted exercise.

We reached the Grands Mulets in the manner described at 7.10 p.m., or five hours and ten minutes from Chamonix, which must be considered a good performance to judge from the time allowed in the guide-books, and when it is taken into account that the chief guide and myself had already accomplished a journey of about 17 miles to the Mer de Glace and Mauvais Pas, 3,000 feet nearly, uphill from Chamonix and down again, on the forenoon of the same day. At the Grands Mulets, during a stay of seven hours (7.10 p.m., 25th, to 2.15 a.m., 26th), none of our party complained of cold, the degree of which, judged by sensations only, did not fall much below freezing point within the hut during any



part of the night. The hut, under the immediate management of a small staff (two people) detached from the Chalet at Pierre Pointue (*vide sup.*), was in fair order, provided with blankets and eatables, the latter, however, not of a very appetising kind. I was content with a little soup prepared soon after our arrival, after which I laid down, fatigued certainly, though not distressed in any way, and quite warm enough, despite the wind which, blowing in gusts every now and then, found its way through the not very air-tight window above my cot. My stable companion in the most habitable apartment—a room about 12 feet square—was a young Frenchman who was resting for the night, having descended from the summit in the afternoon, and who comforted the less advanced traveller by the expressions "*effrayant*," "*épouvantable*," as applied to his morning adventure.

My complaint at this stage was of sleeplessness; my guide companions appeared to be in their usual health, in no way disturbed by the situation. They were up betimes, their movements being audible to me on my wakeful pillow, an hour or more before I was called at 1.30 a.m. After a toilet of the briefest and most unfinished description, I forced myself to partake of an omelet with coffee and milk and some coarse bread. My companions, having disposed of a square morning meal, were meanwhile providing themselves with another substantial repast for the upper journey, which included bread, meat, honey, and claret, the last-named carried in a flat circular tin slung on the porter's back.

At 2.15 a.m. we threaded our way by the dim light of a small lantern round the bare shelving rock (Fr. *vire*) adjoining the Cabane to the more open space covered with snow on the summit of the glacier. The ascent was gradual over good ground on the whole, though the snow was soft and impeded progress in places, till we reached the Grand Plateau—12,000 feet above the sea—soon after daylight. The rising sun, with its well-known sublime effects at these altitudes, followed us during our advance westward from this point over much steeper ascents, varied occasionally by shorter, comparatively easy gradients, till the Vallot hut, situated on the edge of a shelving rock near the lower observatory and 2,000 feet below the summit, was reached about 7.30 a.m. Here a halt of upwards of an hour was made, during which the guides had a good second breakfast, while I—rather chilled by the slow progress and frequent short halts which were necessary on my account, to take breath and slake thirst with lumps of frozen snow during the steeper ascents in the cold of the early morning—wished to be let

alone and merely rest. I did, however, eat a little bread and chicken by compulsion and after entreaty on the part of my comrades, who rightly considered that I should want all I could take in the way of food for the last struggle in front of us. I had with me a bottle of coffee and milk, which I did not relish, and finished my scanty breakfast with a draught of claret.

We were now at an elevation of as nearly as possible 14,000 feet, the sky was clear, scarcely a light cloud being visible, the air almost still, and to gaze on the scene of desolation above and around us on every side, while basking in the grateful morning sun, was more acceptable than shelter in the Cabane close by which was accessible to us. One of my thoughtful and always attentive companions procured a blanket from the hut which he placed between me and the snow, near a ledge of rock, on the sunny and sheltered side. Upon this I lay, and, aided by the little refreshment of which I partook and the growing warmth of the sun, in an hour had revived considerably.

It being then 8.30 a.m., we made a start for the final ascent of about 2,000 feet, first in a south and then in a south-easterly direction towards the summit. The "bosses du dromadaire" were first encountered, comprising three successive ice-bound ridges (*arêtes*) with intervening saddles, scarped and precipitous, on either side. Here we were obliged to make frequent short halts and to cut steps on the incline of about 40°, the leader usually making a nick, upon which No. 2 (myself) improved, and the third and fourth in turn doing the same, to facilitate progress. In this way the round shield-like summit, shelving north and south with prolongations in the transverse direction east and west, of an easier gradient by the route of ascent from the west, was reached at 10.30, and at the south-east extremity, where a skeleton hut (since completed as an observatory) had then been recently erected, the summit was gained at 10.45 a.m., August 26th.

A marvellous panorama, under a cloudless sky, revealed itself from this point. Eastward in the far distance Monte Rosa, the Matterhorn, and other peaks of the Pennine Alps; south and south-west the chain of the little St. Bernard (Graian Alps) stretching towards Mont Cenis; between these two points, south-east, in the direction of Piedmont and Turin, a valley, supposed to be that leading to the village of Courmayeur, in which its river pursuing a straight course south-east with a road on its left bank could be plainly seen. West and north-west, an extension of the Mont Blanc chain with no very distant mountains visible. North, the Lake of

Geneva, its blue waters peering out for a great part of its length between peaks of considerable elevation in the foreground which obstructed a complete and continuous view. North-east, immediately at foot, the valley of Chamonix, in which the very houses could be distinguished by the aid of a field-glass; on the right in the same direction north-east, the Aiguilles near Chamonix, and further, over the Tete Noir Pass, the outline of the Rhone valley, where the mountains converge to a basin at Martigny. Following the sky-line still further north-east, with an inclination to the left, a distant but distinct view of the snowy range of the Bernese Alps, the individual peaks, however, not being plainly discernible. Under foot a huge mound capped with eternal snow.

The air was keen and bracing, cold and cutting when a gust of wind, at intervals, whistled through the framework of the unfinished "Cabane" but at other times quite bearable and probably not much, if anything, below freezing point at that time of the day (11 a.m.). Soon after quitting the lower Observatory near the Vallot hut, we discerned a party of five toiling through the snow on our track a short distance behind us. We had previously left the same party resting at the hut. They proved to be four guides escorting an English-speaking man of middle age, whose face was much blistered from the sun and cold air combined. I suffered myself from blistered face and neck on Mont Blanc; and travellers at high elevations in the Himalayas complain of heat as much as, or more than, cold. They arrived at the summit a few minutes after we did. My compatriot and I did little more than exchange salutations and a remark on the stiffness of the final climb, when he and his party, after a breath and a refresher, roped again and were off down the northern face, bound for Chamonix. As we delayed some minutes longer they got a fair start of us and were soon lost to view.

Our stay on the summit did not exceed a quarter of an hour or twenty minutes, as time was precious, to enable us to complete the return journey to Chamonix the same day, which we did, without staying a second night at the Grands Mulets. Accordingly we followed, this time some way behind our leaders, first down a gradual slope on the north face of the mountain, ending soon in a very precipitous descent which we made zig-zag fashion over frozen snow for a considerable distance into a steep gully (*coulair*) where the snow had accumulated, and, being now partially thawed by the increasing heat of the day, made progress fitful and irregular. At this stage a rest at intervals would have been most acceptable, but was not permitted by the guides, who dreaded the descent of an avalanche at

this time of day (about noon) and in our particular situation. At the lower end of this gully an equally steep but shorter descent—really over the face of a glacier—brought us to our promised land at the south extremity of the Grand Plateau, where we halted about 1 p.m. at safe distance from the treacherous eminences by which we were surrounded.

Words fail to describe the unparalleled grandeur of this secluded spot. Cold, barren, and trackless, except for the footprints, soon obliterated, of the occasional traveller, destitute of all traces of life, inhospitable, scarce accessible to the soaring eagle, approached only by the enterprise and endurance of man, a plain and unsullied whiteness, surmounted by the azure vault of heaven, encircled by an adamant barrier of perennial snow and ice, mysterious and weird in its loneliness, a sealed volume, revealed to the outer world solely by the majestic glaciers which dip their probosces into the valley below.

Our halting ground for the space of half an hour or so lay in this open plain without shelter of any kind; the sun had acquired considerable power, and here I felt the unpleasant effects of unusual elevation more than hitherto—in headache, some excitement of the circulation, and nausea. These, however, soon passed off. Here, also, my companions found another opportunity of regaling themselves with wine (if not milk) and honey, while I looked on anxiously waiting for their grace after meals, quite refreshed on nothing except a rest, and braced up for the homeward journey. At last we moved directly across the level plain for upwards of a mile to its northern extremity, where we struck the path we had left in the morning and actually picked up a lantern left near the track after daylight when it was no longer of use. It will be gathered from this statement that the routes of ascent and descent here diverge; for the remainder of the downward journey they are identical.

At this point our hitherto good fortune did not desert us. The avalanche, so much dreaded by Alpine travellers, had indeed appeared, but at a safe distance from us, eastward of the Grand Plateau, as we had emerged from it and were travelling securely at a good pace over the incline known as the Grandes Montées towards the Petit Plateau, about an hour from the Grands Mulets. A sharp rattle resembling the crack of a piece of ordnance, a look round in the direction whence the sound came, and lo! a shower of snow and *débris*, followed instantly by an enormous frozen mass, which leaped from the side of the sullen mountain, to be lost to

view the next moment in the ravine below ; another cloud of snow in its track and all was over !

We reached the Grands Mulets at 3.30 p.m., and, resting there for half an hour only, retraced our steps across the glacier of Busson which we had safely traversed by 5.30 p.m., in broad daylight and a somewhat hot afternoon sun. The remainder of the journey to Chamonix was entirely uneventful, performed on foot, after unroping at the edge of the glacier, and mostly in the dark after leaving Pierre Pointue (7,000 feet), where we made a short halt.

We arrived at Chamonix a little before 9 p.m., having made no haste, the roughness of the road and consequent slackness of our pace in the dark keeping time admirably with our tired, yet by no means exhausted, condition. I registered my ascent the next day at the Bureau des Guides, receiving the number 1,344 since Balmat's first ascent in August, 1786, Colonel Beaufroy's name appearing as the first Englishman, third on the register, immediately after that of de Saussure—both the latter in August, 1787, the year after Balmat's ascent. It is more than probable, however, that many ascents have not been registered, especially of late years.

We were absent from Chamonix altogether thirty-one hours—from 2 p.m. August 25th to 9 p.m. August, 26th—of which about twenty-one hours were spent in travel (divided between thirteen during ascent and eight during descent respectively), and ten in halts, the last including a night of seven hours at Grands Mulets on the upward journey, and three elsewhere, including twenty minutes or so on the summit.

As regards the merits of the ascent, I may further be permitted to quote the words of an independent and competent authority, Sir Martin Conway, in his "Alps from End to End," *vide Pall Mall Gazette* of July 14th, 1894, wherein he writes :—

"The general public are right to regard Mont Blanc as pre-eminent among the Alps ; for not only does it surpass all others in altitude, but it outshines them in splendour of form and dignity of mass, it forms the subject of a longer and more eventful history, it is overshadowed by the gloom of more calamities, it commands a more glorious panorama, it possesses nobler and more varied ice-scenery, and its ascent enters into the fabric of the memory of more intelligent persons than is the case with any other mountain in Central Europe."

I may remark in conclusion, that 15,000 or 16,000 feet of elevation in the Tropics is by no means the equivalent of a similar height

in Europe, where the snow-line is much lower and mountaineering difficulties are encountered much earlier in the line of ascent than in the Tropics; also, that in my own case I was severely handicapped by a long morning walk (to the Mer de Glace, *vide sup.*) on the forenoon of the day of ascent.

A word as to expense: £15 to £16 should cover necessary expenses of the trip, say, from London, including cost of special outfit as detailed.

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## Reports.

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### THIRD REPORT OF THE COMMITTEE ON PHYSIOLOGICAL EFFECTS OF FOOD, TRAINING AND CLOTHING ON THE SOLDIER.

(Continued from p. 94.)

BACTERIOLOGICAL REPORT, BY MAJOR C. E. P. FOWLER, R.A.M.C.

#### *Tin No. 1.*

Beef, L, canned; Supply Reserve Depot, November, 1904. Examined January 21st, 1907.

Tin undamaged. One hole only sealed. Both ends much blown. On puncture there was an escape of most offensive gas, of putrid odour. Many cultures were made into broth tubes from material extracted by the insertion, through the puncture hole, of a sterile wire. The broth tubes were placed under aerobic and anaerobic conditions and incubated at 37° C. and 22° C. On opening out the tin, the contents appeared to be in a decomposed condition. The meat fibre was softened, the fat semi-fluid, the gelatine liquefied, and the putrid odour most penetrating. The contents were markedly acid. The material at the ends of the tin showed the greatest signs of decay, but the whole contents were more or less affected. The inside of the tin was not much blackened.

February 5th, 1907.—The broth tubes under aerobic conditions show no sign of growth. The broth tubes under anaerobic conditions at 22° C. show no sign of growth. Of the broth tubes under anaerobic conditions at 37° C., one shows a marked growth, three of the others a poor growth. All these possess the same offensive and putrid odour as the original meat. The contents of the broth tubes showing a growth were examined; each contained the same organism in pure culture possessing the following characters:—

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*Morphology.*—Bacillus 6 microns long by 0.6 micron broad, ends rounded. Motile. Large oval polar end-spores.

*Staining.*—Stains by ordinary dyes and retains Gram's stain.

*Growth.*—Only under anaerobic conditions, slowly at 37° C., and extremely slowly at 22° C.

*Broth.*—Growth visible after about four days at 37° C., gradually becomes thicker, and a fine granular deposit takes place. Odour putrid.

*Gelatine.*—Slow softening in five or six days. Colonies filamentous.

*Agar.*—After about five days a fine, greyish-white film is seen on the slope, on a plate the colonies are finely transparent.

*Litmus Milk.*—There is slow separation of casein and whey. After about seven days' incubation at 37° C., the whey is either slightly pink or yellow and the casein separated; this gradually dissolves and sinks as a grumous mass to the bottom of the tube. Odour putrid.

*Neutral Red Glucose Agar.*—After about four days at 37° C. there is free gas formation and the red colour becomes reduced to a bright yellow.

*Effect on Animals.*—Doses of 2 or 3 cc. of a thick putrid broth culture injected hypodermically and intraperitoneally into guinea-pigs were without any harmful action.

#### *Tin No. 2.*

From the same supply as tin No. 1. Tin undamaged. One hole only sealed. Much blown at both ends. On puncture there was an escape of foul gas. The cultures were made as in No. 1, and the same organism was isolated in pure culture. On opening out the tin the contents were in a similar condition to those of No. 1.

#### *Tin No. 3.*

From the same supply as tin No. 1. Tin undamaged. One hole only sealed. No sign of any blowing. Externally it appears a perfectly sound tin.

February 11th, 1907.—On puncture there was no escape of gas. Cultures were taken as in No. 1 tin. On opening out the tin there was a foul smell of decomposition. The whole surface layer of the opened end was seen to be decayed, but this appearance only extended about  $\frac{1}{2}$  inch into the substance of the meat and down the interstices. Cultures were made from the decayed material. On scraping this layer away, the remaining contents of the tin appear perfectly sound and without smell. The other end and the sides of the meat showed no change. The inside of the tin was not much blackened.

February 20th, 1907. There was no sign of growth in any culture tube.

#### *Tin No. 4.<sup>1</sup>*

Compressed, cooked, corned beef. December, 1904, stamped on tin. Tin undamaged. Pyramidal tin distinctly bulged at top and slightly at

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<sup>1</sup> This tin was not included in the chemical analysis.

bottom, resilient to pressure. Labelled by Supply Reserve Dépôt. Bulged with too much meat.

February 20th, 1907.—A small puncture was made on the top of the bulging part under a drop of water. There was no escape of gas. The water slowly entered the hole. Cultures were made into broth as in No. 1. On opening out the tin the meat appears perfectly sound. No smell. Taste sweet. The meat was consumed by several people without any deleterious effect.

March 1st, 1907.—There was no sign of growth in any of the broth tubes.

*Tin No. 5.<sup>1</sup>*

The same brand as in No. 4. Tin undamaged. No bulging. On puncture no escape of gas. On opening out the tin the upper layer of meat and fat appears deteriorated or decayed. No smell. Cultures were made from all parts of this altered material. (February 27th, 1907.) The remainder of the contents were sound.

March 10th.—There was no growth in any of the culture tubes.

The organism isolated from tins Nos. 1 and 2 shows the characteristics of the *Bacillus putrificus coli* of Bienstock, which would appear to be identical with the *B. cadaveris sporogenes* of Klein. It must have been present in the meat before packing, resisted the process of sterilisation, and survived with very slow growth under the strictly anaerobic conditions present.

*The vitality of these spores is considerable, as they will resist boiling for one or two minutes.*

This same organism had probably been present in No. 3 tin, survived for a certain time and then died out.

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APPENDIX II.<sup>1</sup>

REPORT ON FURTHER ANALYSIS OF TINNED MEATS, BY MAJOR  
W. W. O. BEVERIDGE, D.S.O., R.A.M.C.

In my first report on the analysis of tinned meats, owing to a sufficient number of samples of roast beef, corned and roast mutton not being procurable from the Director of Supplies, a trustworthy average of their nutrient values could not be given. Since then I have purchased locally a further supply of twenty samples of various brands. These have been analysed, and the results recorded in the following table, which includes the samples already given in the First Report.

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<sup>1</sup> This tin was not included in the chemical analysis.



PERCENTAGE COMPOSITION OF MEATS EXAMINED.

Nature of sample	No. of tins exd.	No. of analyses	—	Water	Ash	Total nitrogen	Protein, N. X 6.25	Fat	Calories
				Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per lb.
Roast beef	12	14	Maximum	71.05	5.02	5.43	33.94	36.67	1,526
			Minimum	38.32	1.99	1.85	11.56	5.37	762
			Average..	58.23	3.22	4.28	26.75	12.90	1,042
Roast mutton	7	9	Maximum	58.74	2.75	5.22	32.63	34.32	1,670
			Minimum	38.39	0.41	3.18	19.88	21.13	1,398
			Average..	46.22	1.52	4.24	26.50	25.74	1,578
Corned mutton	9	24	Maximum	59.22	3.76	5.35	33.44	42.19	2,064
			Minimum	29.15	1.26	2.32	14.50	12.66	1,354
			Average..	43.05	2.39	4.21	26.34	28.12	1,601

## APPENDIX IV.

## REPORT ON THE NATURE AND CAUSES OF THE BLACKENING OF THE INTERIOR OF TINS. BY MAJOR W. W. O. BEVERIDGE, D.S.O., R.A.M.C.

The following investigations were made with a view to arriving at some definite conclusions as to the nature and cause of the blackening of the interior of tins containing preserved foods.

In America the manufacturers of canned meats speak of the blackening of the interior of the tins as "can-burn," their explanation being that it is due to the application of too great a heat during the progress of sterilisation.

Although excessive heat may aid, and undoubtedly is an important factor in the process, it is evident that this alone, even at the highest temperatures used for sterilising, cannot produce any discoloration of the interior of the tins.

The blackening is caused by some chemical change brought about by the action of certain substances in the food on the metal of the tin with which it is in contact during sterilisation. If we take a clean, bright, empty tin, tightly solder it up, and sterilise at 150° C., or even higher, for some hours, no discoloration results.

Except in the case of putrid foods, such as meat, the blackening of the interior takes place during sterilisation only, and there is no evidence to show that any increase takes place, however long the tin of food is kept, so long as the contents remain sterile.

It is probable, therefore, that any danger from the absorption of metals, such as tin, increasing in amount on prolonged keeping, can be discounted.

In the case, however, of meats which have become putrid in their tins from the result of bacterial action, owing to their having acquired a higher acidity, and to the formation of certain gases, the metals derived from

the tin may increase in amount. This is largely due to an actual erosion of the tin-plating itself.

The chief cause of the presence of metals, such as tin and zinc, in sound tins of preserved meat is attributable, in all probability, to the presence of the fluids used in soldering, or to solder accidentally gaining entrance during the final soldering of the tins.

The mere discoloration of the interior of the tins has no injurious effects whatever in itself, either to the consumer or to the food.

We have found that of the three metals, iron, zinc, and tin, iron is more rapidly acted upon than zinc, and zinc than tin, so that the purity and thickness of the tin plating influences somewhat the extent of the blackening of the interior. When the tin plating is thick, and consists of a good proportion of tin evenly distributed, very little blackening occurs during sterilisation properly conducted.

It is in thin, inferior plating that much blackening is more apt to occur.

#### *The Cause of the Blackening.*

It has been assumed that the blackening of the interior of tins containing preserved foods is due to the formation of sulphides of the metals, brought about by the action of hydrogen sulphide, derived from the food.

In the case of putrid tinned meats, bacterial action produces large quantities of hydrogen sulphide and mercaptan compounds, derived from the protein of the meat, but in fresh meat no hydrogen sulphide should be produced.

The reaction of tinned meats, sound and putrid, and of fresh butchers' meat, is always acid, whereas the reaction of putrid butchers' meat is alkaline, due to the action of aerobic bacteria. It is a question how far the degree of acidity or alkalinity plays a part in the causation of blackening the tins. Excess of acidity, such as may occur in preparations of tinned fruits and vegetables, has been credited with the power of causing absorption of considerable quantities of metal from the tins, the amount absorbed being proportional to the amount of acid present: but acidity in itself does not cause blackening.

The increased acidity of tinned meats when decomposed is brought about by the action of anaerobic spore-bearing bacilli, and consists chiefly of lactic and butyric acids.

It appears probable that alkalinity of the food has a far greater effect in the causation of blackening than can be ascribed to acidity.

It seems reasonable to suppose that during sterilisation of meat in tins a certain amount of hydrolysis of the albumins occurs: and that the formation of the sulphydryl group, SH, is proportional to the degree of alkalinity combined with the amount of heat acquired.

If proteid matter is boiled with a solution of sodium hydroxide in the presence of a lead salt, a black precipitate or a brown discoloration takes

place, constituting the well-known lead sulphide reaction of Vogel. If a salt of tin be substituted for the lead, as for instance when some meat is boiled with sodium hydroxide solution and stannous proto-chloride, a brown discoloration results, due to the formation of the sulphide of tin. This reaction depends on the splitting off of the sulpho-hydrol group, SH.

It appears probable, therefore, that this might constitute one of the causes whereby the interior of a tin is discoloured, as it can be shown that the blackening is partly composed of sulphide of tin and iron.

The actual cause in this case would be the formation of a sulphide by means of hydrogen sulphide, ethyl or methyl-mercaptan, and possibly ethyl sulphide. Blackening from this cause would more likely occur in foods which have acquired an alkaline reaction, either during the process of pickling or from commencing decomposition.

To determine experimentally whether the sulphur compounds split off by hydrolysis of meat had any action upon the tin-plate, the following experiments were conducted :—

A series of small tins, made from the same tin-plate, were procured of a uniform size.

Into each, equal portions of fresh beef were introduced and hydrolysed with dilute acids and alkalies for periods of four and twelve hours, the condition of the interior of the tins being noted at the termination of the experiment.

The results are shown in the following table :—

Reagent	Strength of solution used	Condition of interior of tin after four hours	Condition of interior of tin after twelve hours
	Per cent.		
HCl .. ..	1	Bright .. ..	Bright.
HCl .. ..	2	Very slight blackening ..	—
HCl .. ..	3	Slight blackening .. ..	Slight blackening.
HCl .. ..	5	Slight blackening .. ..	Slight blackening.
NaOH .. ..	1	Very slight blackening ..	Much blackening.
NaOH .. ..	2	Slight blackening .. ..	Much blackening.
NaOH .. ..	3	Moderate blackening ..	Much blackening.
NaOH .. ..	5	Very much blackening ..	—
Lactic acid ..	2	Bright .. ..	Bright.
Boiling water alone	—	Bright .. ..	Bright.

These results show that an alkaline reaction has a greater effect than an acid reaction, and that the amount of discoloration depends on the strength of the acid or alkali and the length of exposure.

In degrees of alkalinity below 1 per cent., a high temperature exceeding 110° C. is essential to the process.

As one knows, albumins can be dissociated by means of superheated steam and the sulphur compounds split off. For instance, Chittenden

and Mears<sup>1</sup> found that sulphur was liberated on heating coagulated egg albumen in a sealed tube at 150° C.

E. Salkowski<sup>2</sup> heated weighed quantities of flesh, freed from fat and sinew, with water in a small pressure boiler, and found that in 600 grammes of flesh heated with 2,400 cc. of water for eight hours at 120° C., the nitrogen amounted to 13.93 per cent., while the sulphur set free was 0.53 per cent. When heated for eight hours at 131° C. the nitrogen amounted to 14.61 and the sulphur to 0.51 per cent. The ratio of sulphur to nitrogen was in fresh flesh 1 : 16.7, whilst in the experiments the ratio was 1 : 31, showing that sulphur had been split off.

The above experiments represent practically the conditions of the sterilisation of tinned meats; the meat contains the necessary moisture and the sealed tin fulfils the conditions of the pressure boiler: a temperature of 120° C. being frequently used to sterilise the contents. In sterilising tinned meats the contents are subjected to steam under pressure, and the more moisture there is present, and the higher and longer sustained the temperature, the greater will be the dissociation of the protein matter.

The reason given by the manufacturers that "can-burn" is due to excessive heating may, to a certain extent, be considered a plausible one in the light of the above explanation.

It will be noted that dried preparations of food give no discoloration to the interior of the tins on sterilisation, so that the presence of moisture is essential to the process.

To ascertain whether the tins are acted upon when perfectly fresh meat is compressed into tins and sterilised, the following experiments were carried out:—

(a) Three and a half ounces of fresh lean beef, the acidity of which was 1.08 gramme per cent., reckoned as lactic acid, were partially cooked by boiling in water with a little salt. After boiling the acidity = 0.99 per cent.

The meat was then rammed into a small tin, the interior of which was quite bright, and the tin tightly soldered up. This was then sterilised in a solution of calcium chloride boiling at 110° C. until blown, when the tin was punctured to let out steam and fat, quickly resoldered, and sterilised again at 110° C. for one hour.

In a control tin the temperature at the centre of the contents (taken by a special thermometer, the tin being hermetically sealed) registered 100° C. in nineteen minutes, 105° C. in twenty-two minutes, and 110° C. in thirty minutes; so that 110° C. was maintained for thirty minutes in the experimental tin.

The tin was then removed and cooled, and incubated at 37° C. for one week. On opening the tin at the end of this period the contents were

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<sup>1</sup> *Journal of Physiology*, xv.

<sup>2</sup> *Zeit. f. Biol.*, "Flesh Foods," C. Ainsworth Mitchell, xix., 1900, p. 117.

proved to be sound and sterile, and the interior of the tin was perfectly bright. The reaction of the meat was still acid.

(b) The same procedure was followed as in (a), with the exception that the fresh beef was partially cooked by steaming. The acidity after steaming was the same, namely, 0.99 per cent.

After incubation at 37° C. for one week the tin was opened, and the contents were found to be remarkably fresh, palatable, and quite sterile. There was only a slight patch of discoloration at the bottom of the tin, the remainder being perfectly bright.

(c) Fresh lean beef was sterilised, as above, for two hours at 120° C. On opening the tin the interior was found to be quite bright.

(d) Fresh lean beef, acidity 1.08 per cent., was sterilised as before, except that it was not partially cooked, by steaming, at a temperature of 150° C. for two hours.

On opening the tin the interior was quite bright, but the meat was friable and charred. Sterilisation of meat at this temperature, without a large proportion of water, is impracticable.

To ascertain what effect slight decomposition of the meat prior to sterilisation had upon the tins—

(e) Lean beef which was just commencing to decompose on the surface, having an alkaline reaction equivalent to 0.12 per cent. as NaOH, was packed into tins and sterilised as before at temperatures of 110°, 120°, and 130° C. for one and a half hours.

After exposure to 110° C. there was no blackening, but after 120° and 130° C. the interiors of the tins were greatly blackened.

To ascertain the influence of an alkaline reaction—

(f) Fresh lean beef was made alkaline with a 1 per cent. NaOH solution, packed and sterilised as before, at 120° C. for one hour. The interior of the tin was slightly blackened.

(g) Under the same conditions, except that a 2 per cent. solution of NaOH was used, and the tins sterilised at 150° C. for one and a half hours, the interior was greatly blackened.

NOTE.—In the case of experiments (f) and (g), the blackening may have been increased by the alkaline solution alone, apart from hydrolysis of the albumen, as the strength of the solution used was somewhat high. Therefore, these experiments are not conclusive.

From the above experiments, it would appear that tainted meat, having an alkaline reaction, is at least one of the causes of the discoloration of tins, but a high temperature during sterilisation is essential. As shown experimentally, perfectly fresh meat, having an acid reaction, can be sterilised at even 150° C. for two hours, with little or no discoloration of the tins resulting.

Corned beef which had already been sterilised, when re-sterilised at 110° and 120° C., had no action upon the tins.

A reddish-brown soapy coating of the interior of tins of preserved meat is sometimes observed, and may be caused as follows :—

It is probable that some of the fat, being under pressure and in the presence of steam during sterilisation of tinned meats, undergoes hydrolysis, glycerol and fatty acids being formed. The free fatty acids may then react upon the metal, forming an oleate of iron. This is borne out by the fact that in many cases some of the greasy discoloration of the interior of tins is soluble in a hydrocarbon, such as paraffin, or in ether or glycerol.

To ascertain whether this action of the fat upon the metal takes place—

(a) Two weighed samples of fresh beef tallow were sealed up in two different tins. In one of these tins the plating of the interior was thick and exceptionally good, in the other it was thin and inferior.

Both tins were subjected to a temperature of 120° C. for one hour in a bath of calcium chloride. At the end of the hour both tins were opened, and it was found that the tin with the good plating was unaffected, whilst that with the inferior plating had patches of greasy discoloration in places soluble in paraffin.

This points to the formation of oleate of iron, and shows that a thick plating gives more protection.

(b) A weighed quantity, 2 ounces of fresh beef fat, was sealed up in a perfectly bright tin, and sterilised for two hours at 113° C. On opening the tin the interior was quite bright.

(c) The same as above, but sterilised at 120° C. On opening the tin the interior was found to be quite bright.

(d) Beef tallow, which had been kept for some weeks, was sterilised as above for two hours at 120° C.

The interior of the tin showed small, brown, greasy patches, soluble in paraffin.

(e) Fresh beef fat, sterilised as above for two hours at 130° C. The tin was discoloured on one side.

(f) Fresh beef fat was sterilised at 150° C. for two hours. The tin showed a brown stain where the fat had rested during sterilisation.

(g) Rancid fat was sterilised for two hours at 150° C. Tin showed brown staining.

#### *Nature of the Discoloration.*

The discoloration of the interior of tins containing moist foods, which have been sterilised by heat, varies from a mere brown stain here and there to complete blackening, and, in certain cases, actual erosion of the metal.

The discoloration is insoluble in water, alcohol and ether, and is not volatilised by heat. It is soluble in mineral acids, and to a large extent by alkalis, such as sodium hydroxide. In many cases, as already referred to, some of the greasy discoloration will be found to be soluble in ether,

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paraffin, or glycerol. From chemical analysis the blackening may be said to be due to: (1) Sulphide of tin; (2) sulphide of iron; (3) (oleate of iron.)

#### *Conclusions.*

(1) Except in cases where the contents of the tin are blackened by contact, or where there is actual erosion of the metal, the discoloration of the tin is probably not in any way deleterious to the consumer, nor has it any injurious effect upon the food itself.

(2) Except in the case of bacterial fermentation, a high temperature, above 110° C., appears to be essential.

(3) In putrid samples of tinned meats, blackening and erosion of the metal can easily be accounted for by bacterial fermentation, caused by anaerobic spore-bearing bacilli, which form large quantities of  $H_2S$  mercaptan bodies and acids: these reacting on the tin form sulphides of the metals.

(4) Perfectly fresh meats having an acid reaction may be sterilised at even a high temperature (120° to 130° C.) without causing blackening of the tin.

(5) Where alkalinity of the food exists, from being tainted or from having become so during the pickling process, and where the heat of sterilisation is carried too far, much blackening of the interior is liable to result.

(6) Acidity of the contents, except where it exists in a high degree, does not cause the same amount of discoloration as in the case of foods having an alkaline reaction.

(7) Excess of fat, combined with a high degree of heat in the presence of superheated steam, is responsible for a certain amount of discoloration.

(8) Much blackening of the interior of tins of meat might be regarded as indicating, in some instances, that the food was not in a perfectly fresh condition before sterilisation, and that the manufacturers in consequence employed higher temperatures during sterilisation than ordinarily used, with a view to ensuring efficient sterility.

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REPORT ON SEVENTH INTERNATIONAL CONGRESS OF  
APPLIED CHEMISTRY.BY MAJOR W. W. O. BEVERIDGE, D.S.O.  
*Royal Army Medical Corps.**(Continued from p. 208.)*

## SEWAGE DISPOSAL AND TREATMENT.

DR. J. GROSSMAN, of Manchester, read a highly interesting and very important paper on the disposal of sewage sludge, in which he said that the present mode of sewage sludge disposal is not only objectionable from a hygienic point of view, but is absolutely against all economic principles. In most places it is dumped on land, after concentration which is carried out by filter pressings, producing a cake containing about 50 per cent. of water and 50 per cent. of solid matter. A town of 100,000 inhabitants will produce some 30 tons of pressed sludge per day, so that the cost of its disposal is very considerable.

Its value as a manure is considerably reduced, and in many cases nullified by the fact that it clogs up the soil, owing to the large amount of fatty matter, grease, and soap contained in it, which comes from domestic sources. It is computed that 400,000 tons of soap are used every year in this country, practically all of which finds its way into the sewage. The sludge cake should, therefore, contain at least 5 per cent. of fatty acids, a quantity which would amply repay recovering, if a practicable process could be found, and would leave a manurial residue which would neither clog the soil nor create a nuisance.

The difficulties have been partly chemical and partly mechanical. Broadly speaking, the problem has been approached from three different directions :—

- (1) The extraction of grease by means of solvents.
- (2) The treatment of the sludge by destructive distillation.
- (3) The treatment of the sludge by non-destructive distillation.

The first two processes cannot be made to pay. It was the third process to which the author had given special attention for the past five years, having tried it on a large scale at Bradford, where the sludge is very rich in grease. Owing to mechanical defects it was not satisfactory, although the grease distilled over found a ready market at from £7 to £8 per ton. He now has remedied these defects and is using a process which enables him to completely distil off the grease, and to obtain a residue free from grease in the form of a dry powder, which is eminently suitable for manuring. It is now working at Oldham. His process is as follows: The sewage is settled in large tanks from which the sludge, containing about 90 per cent. of water, is obtained in the usual way. The sludge cake is dried and then mixed with a suitable quantity of sulphuric acid. The mixture is then passed through a special retort,



consisting of a cylinder in which revolves a hollow shaft bearing perforated hollow paddles, and the sludge is thus thoroughly agitated whilst steam is made to permeate the mass. The steam carries with it the fatty acids, and is condensed in a tower into which water is injected. The condensed fat collects on the surface of a tank, and after drying has the following average composition :—

Fatty matter (saponifiable)	..	..	..	..	60.0	per cent.
Unsaponifiable matter	..	..	..	..	22.0	„
Mineral and organic impurities	..	..	..	..	18.0	„
					100.0	„

The crude grease contains 70 per cent. of stearic acid, a valuable article of commerce used in large quantities. The residue varies, owing to the constant variations in the composition of the sewage sludge. It is of a brownish colour, fine as flour, quite odourless and is sterilised. It contains 40 per cent. of partly decomposed organic matter, and thus resembles humus, besides containing nitrogen, potash and phosphates, constituting the basis of a good manure. The intrinsic value of the manure obtained on the basis of the above would be 25s. per ton, but the author takes it as 10s. a ton in basing his calculations. After explaining the working charges and values of the products he estimates the average profit for a town of 100,000 inhabitants at about £2,500 per annum. The cost of working by his process would amount to £2,616 per annum, whilst the amount realised by the sale of the products obtained should come to £5,078. He concluded by pointing out that his method not only solves the problem of the disposal of sewage sludge in accordance with hygienic principles, but does so on a remunerative basis, and exhibited samples of the products obtained at Oldham.

The aerobic method of sewage treatment was dealt with by Mr. W. J. Dibdin, F.I.C. He said the organisms available for sewage treatment included bacteria, fungi, infusoria, and most other protozoa (according to climate and temperature), larvæ, and worms. The essential requirements for aerobic decomposition were :—

(1) The solids should be exposed to the air and action of organisms as completely as possible. Consequently, the solids should be spread in thin layers.

(2) The liquid containing dissolved or partially soluble substances should at all times have sufficient oxygen in solution to prevent an aerobic action. The term "maintained aeration" referred to the degree or percentage of the total possible oxygen dissolved in a liquid; 100 per cent. maintained aeration indicates that the water contains as much free oxygen as an equal quantity of pure water can dissolve from the atmosphere in twenty-four hours when exposed in a quiescent state in an open vessel.

He found in practice that a sewage should not remain quiescent for

more than two hours; during this period the suspended solids will settle. In order that these solids should be spread in thin layers it was necessary that they should be deposited from shallow layers of water. He effected this by using large pieces of coke, clinker, or ballast in the tank, thus forming the coarse contact bed. With the admission of air on emptying the bed the layers of putrescible matter were well aerated and rapidly decomposed by the organisms which were thus cultivated. The whole process was inoffensive and the beds continued to work for from five to eight years.

In order to obviate both the silting up of the coarse beds and also the formation of sludge, he introduced the slate bed and obtained the following results after six years experience with it:—

- (1) The suspended solids in the sewage are removed during quiescence.
- (2) The albumenoid ammonia is reduced 20 to 50 per cent., according to the sewage treated.
- (3) The amount of residue from the solids escaping in the effluent is less than 3.0 grains per gallon, *i.e.*, a trace.
- (4) The decomposition of the solids is effected without nuisance.
- (5) The effluent is charged with forms of aerobic life, and consequently can easily be purified by further treatment.

The author was of opinion that, provided on exposure the final effluent maintained 50 per cent. of maximum oxygen, it will support fish life and purify itself further by the continued action of the organisms contained in it. To obtain such an effluent, either contact beds or continuous filters may be used. He did not see any real advantage in continuous filtration, as periodically such filters must be rested. When effluents were to be discharged where they would affect water supplies or shell fisheries, the desideratum was that they should be non-pathogenic; a little more or less organic matter was nothing. In these cases sterilisation by ozone or otherwise was to be recommended.

Mr. F. Wallace Stoddard, F.I.C., described a "continuous nitrifier," and gave tables of analyses, illustrating the effects obtained and considered to justify the conclusions.

- (1) That free exposure of the surface and base of the biological filter to air is essential for efficient oxidation, but that lateral aeration is comparatively unimportant.
- (2) That whilst it is essential that the liquid should be so distributed that each particle of medium shall receive only so much as will flow in a thin film over its surface, there is no advantage in the actual subdivision into drops or in causing drops to fall through the air on to the medium.
- (3) That the best results are obtained by a literally continuous flow of liquid throughout the system, and that any intermission or interruption, even for so short a period as ten minutes, entails a loss of efficiency.
- (4) That the optimum temperature is about 30° C., but that putrescible suspended solids may interfere.

(5) That the weight of nitrogen oxidisable is practically constant for a given internal filter surface and temperature, whatever the degree of dilution may be, and that this weight for a cubic yard of medium of  $\frac{1}{8}$  inch (3 mm.) grade at summer temperature is approximately  $\frac{1}{4}$  lb.

(6) That the presence of "humus" is not essential to nitrification.

(7) That the conditions of the experiments described are inconsistent with the "absorption theory" of sewage disposal. It is shown that not only ammonia and urea, but such substances as gelatine and albumen are directly and immediately oxidised as they pass in solution over the medium of a mature filter.

Professor Kenwood and Dr. Kay-Menzies read a paper on the chemical evidence of slight sewage pollution of sea-water. They pointed out that the chlorine figure, often useful in indicating animal contamination in fresh water, was useless when dealing with sea-water. The oxydised nitrogen figure in polluted sea-water may also not be available, and its absence is no guarantee of freedom from such contamination in a dangerous form, and may indeed be even more significant of danger than its presence in sea-water exposed to recent contamination.

The free ammonia figure on the contrary was a very valuable clue to contamination of sea-water, forming invariably an item of evidence which, starting at the actual time of contamination, persists for several weeks. From the results of their investigations they concluded that the free and saline ammonia figure furnished the only reliable chemical guide to the lesser degrees of animal contamination of sea-water, and suggested that an ammonia figure much exceeding 0.002 is certain evidence of the sewage contamination of sea-water.

Messrs. J. E. Purvis, Macalister, and Minnett gave an account of chemical and bacteriological experiments they had conducted in order to ascertain the action of sea-water in the decomposition of sewage with 1 per cent., 5 per cent., and 10 per cent. mixtures of weak and strong sewages in sea-water. They found that (1) in all the mixtures of sewage and sea-water, either with strong or weak sewage, and with variations in the amounts, from 1 per cent., 5 per cent., and 10 per cent. of sewage there remained 70 per cent. of undecomposed and unacted upon nitrogenous compounds after eighteen days incubation; that (2) 1 per cent. mixtures of *weak* sewage and sea-water showed neither nitrates nor nitrites after eighteen days incubation; that (3) 5 per cent. mixtures of weak sewage and sea-water showed neither nitrates nor nitrites after eighteen days; that (4) 10 per cent. mixtures of *strong* sewage and sea-water gave nitrites for four days, and then they disappeared, but that no nitrates appeared; that (5) 5 per cent. mixtures of *strong* sewage and sea-water showed nitrites for three days, and then they disappeared, but that no nitrates were produced at any period; and that (6) 1 per cent. mixtures of *strong* sewage and sea-water showed nitrites at the end of

the first day's incubation, and then they disappeared, but that no nitrates were produced at any period.

The general conclusions of the bacterial investigations were (1) that there was a rapid diminution in the total number of organisms, both in the sewage and the mixture of sewage and sea-water, but the diminution was far greater in the mixture; that (2) the denitrifying organisms could live a longer time in a mixture of sewage and sea-water when potassium nitrate was also present in the mixture; and that (3) the nitrifying organisms did not appear to be present in the sewage or in the mixture of sewage and sea-water at any period. The bacterial investigations, therefore, confirmed the chemical ones. Decomposition of sewage in sea-water cannot take place rapidly, so that simple compounds of  $\text{CO}_2$ , water and nitrates are produced.

The experiments proved that it was quite unsound to pour sewage directly into the sea, or even into a tidal estuary. It should first undergo some preliminary treatment, whereby the greater part of the complex compounds may be rapidly and completely destroyed.

Messrs. Fowler and Arden read a paper on the "Disposal and Purification of Trade-effluents," in which they said the polluting effects may be due to:—

- (a) An excessive quantity of suspended solids.
- (b) Substances capable of fermentation or putrefaction, and consequent production of nuisance.
- (c) Colouring matters, such as vegetable or artificial dye-stuffs.
- (d) Substances poisonous to aquatic vegetation or fish-life.
- (e) Oily matters, fat and soap.

They went on to describe briefly the respective methods of treatment, and summarised the law as to trade-effluents, giving cases illustrating the difficulties noted.

Dr. Adeney explained his apparatus for determining the rate of absorption of atmospheric oxygen by polluted waters, and showed one form. An interesting discussion followed, in which several members gave their own personal experience of the working of this apparatus.

E. A. Letts communicated a paper on nuisances caused by certain green seaweeds, and indirectly by sewage, much of which appears in the Fifth Report of the Sewage Commissioners.

T. H. Castle and E. Elrove, Washington, U.S., described a new method they had devised for the determination of nitrites in sanitary water analysis by means of a permanent standard, namely, fuchsin—S, used in a simple form of colorimeter.

As is known, it is possible to determine nitrites by means of a standard iodine solution in chloroform, but it is very unstable, fading rapidly. The fuchsin—S. standard of Elrove has not this disadvantage, and preserved its colour unchanged for seven months. This method has an advantage that it probably would be of much value for Service use,

as reasonably accurate nitrite determinations could be made in the field at the moment the sample was collected. The method will be tried at the Hygiene Research Laboratory, Royal Army Medical College, and a further report published later on.

#### BROMATOLOGY.

This was one of the subsections of hygiene, and signifies the science of food. Mr. F. W. Beck read a paper on the advantages and disadvantages of legally binding standards of composition of foods. He argued that a general fixing of standards for natural products was of doubtful utility, and that a standard in the case of mixtures such as coffee and chicory was futile, because quality was more important than quantity. He thought, however, there was great necessity for standards as to preservatives and colouring matters. All standards should be subject to variation on adequate disclosure. In English legislation the only standards fixed were for the composition of milk, water in butter and margarine, and the strength of spirits.

Messrs. Moor and Partridge submitted a paper on standards of purity for foods and drugs, and gave a collection of various standards, or figures accepted as standards, which have been adopted or proposed, together with suggestions as to the advisability of a variable standard for articles which are affected by seasonable conditions. Various foods and drinks were considered specifically. They considered 16 per cent. of water allowed in butter to be too high, and suggested the amount of salt should be fixed at 2 per cent. The amount of fat in milk,  $2\frac{1}{2}$  to 3 per cent., was far behind the percentage required in other countries, namely, 3.5 per cent. They suggested that public analysts in every district should publish the percentage of fat contained in the milk supplied by different dealers and should also mention their names.

Mr. Moor suggested grouping the butter producers of the country into associations, each of which should have its own stamp, also that the standard for bread should be that the moisture must not be more than 40 per cent., and that cheese containing less than 30 per cent. of fat should be registered as prepared from skimmed milk.

Mr. Edward Russell and F. Arnaud desired that legal standards should be fixed for milk and suggested new standards for fat based on the average monthly percentages obtained in the case of two large towns, submitting more than 500 samples of milk for analysis annually. The results compared with those obtained by Mr. Droop Richmond on samples from known herds show that the town supplies contain on an average about 0.2 per cent. less fat, this difference tending to decrease during March, April, May and June, the "poor" months of the year, and increase during October, November, December and January, the maximum period. The highest average monthly figure is about 3.7 per cent., the lowest 3.4 per cent., a difference of 0.3.

As the difference between morning and evening milk amounted to 0.5 per cent., a possible figure for genuine milk during the minimum period would certainly be a bare 3 per cent. The author suggested seasonal standards, which might be fixed in two ways, either a 3 per cent. standard for four minimal months, raising the standard to 3.3 per cent. for other periods of the year, or taking a very low figure, such as 2.85 per cent. of fat for the minimal period, raising this to 3.5 during the maximal period, and fixing the standard at 3.3 for the intermediate months. Dr. Thorpe opposed this suggestion on the ground that administrative difficulties would arise and that reform would mean a levelling down of the milk standards. Dr. Avory, of Australia, stated that at the present time in Australia the standard was 3.5 per cent.

G. Cornalba, Chemist to the Royal Experimental Cheese-making Station at Lodi, presented a comparative study of the new methods of detecting watering of milk. He found that a sure means of detecting dilution of milk with water was furnished by the sum of the soluble components of milk. Taken separately these soluble components give no reliable data, as their amounts vary somewhat widely; but their sum varies only between such narrow limits as to render possible detection of a dilution as small as 5 or even 4 per cent.

The mean value of this constant for mixed milk from a number of animals was about 6.25, the limiting values being 5.95 and 6.46. For the milk of single cows the limiting values were 5.80 and 6.60, and with the majority of the cows the value oscillated round the number 6.2. Taking the mean value 6.15, addition of 5 per cent. of water to the milk would lower the value to 5.84.

This constancy of the composition of the serum is always observed, no matter what the age or breed of cows, the period of lactation, the quantity of milk produced, or the diet may be. The establishment of this principle lends support to the view generally held at the present time, namely, that the production of milk comprises two distinct phases: (1) A secretion of a serum almost uniform in composition; and (2) a destruction of glandular tissue which supplies to the serum, in the forms of fat and casein, the products of demolition of the cell.

The refractometric, densimetric and cryoscopic methods of examining milk were discussed, the method devised by the author being in agreement with these physical methods. The refractometric method gave results which were accurate only with milks not very rich in fat and casein. Determination of the density of the serum, which should not be less than 1.030, was capable of revealing dilution of milk to the extent of 10 per cent. The cryoscopic point of normal milk is 0.555, and even with two specimens of colostrum containing: (1) albumin 16.38, lactose 2.19, and salts 1.12; and (2) albumin 3.13, lactose 3.37, and salts 0.90, the respective values were 0.55 and 0.56. The cryoscopic and refractometric methods are applicable only to fresh milk free from preservatives.

The author also communicated a paper on some new criteria for the natural production of milk most suited to the nourishment of infants. With regard to sterilisation of milk, he said, whilst it impaired the digestibility of milk, it afforded no certainty of absolute sterility, the spores of certain germs withstanding temperatures higher than those which can be employed in sterilising. It had also no influence on the toxins developed by bacteria.

The changes produced in the composition of milk by sterilisation were:—

(1) The albumenoid substances are profoundly modified and the albumen rendered insoluble.

(2) The organic phosphorus compounds of calcium are altered so as to become difficultly assimilable.

(3) The harmful germs are destroyed, as also are the enzymes taking part in the digestion of the milk.

(4) The lactose is caramelised and the flavour of the milk injured.

He considered that by selection of cows in full lactation, on the basis of their individual characteristics, it is possible to obtain milk having a composition the same as that of prepared milks and approaching that of human milk for the nourishment of infants.

Mr. Norman Booth referred to the absence of any legal standard for chocolate in England, although in some of the European countries standards are in force, and pointed out that articles of which the sale would be prohibited in some other countries are permitted to come without restriction on to the English market.

He suggested the following definitions for chocolate foods as reasonable:—

(1) *Unsweetened Chocolate* must be prepared exclusively from roasted, shelled, finely-ground cocoa beans, with or without the addition of a small quantity of flavouring matter, and should not contain less than 45 per cent. of cocoa butter. (Note.—There is an average of 50 to 55 per cent. of butter in cocoa.)

(2) *Sweetened Chocolate*.—A preparation consisting exclusively of the products of roasted, shelled, finely-ground cocoa beans, and not more than 65 per cent. of sugar, with or without a small quantity of harmless flavouring matter.

(3) *Granulated or Ground Chocolate for Drinking Purposes*.—The same definition as for sweetened chocolate should apply here, except that the proportion of sugar may be raised to not more than 75 per cent.

(4) *Chocolate-covered Goods*.—Various forms of confectionery covered with chocolate, the composition of the latter agreeing with the definition of sweetened chocolate.

(5) *Milk Chocolate*.—A preparation composed exclusively of roasted, shelled cocoa beans, sugar, and not less than 15 per cent. of the dry solids

of full-cream milk, with or without a small quantity of harmless flavouring matter.

The addition of starch other than that naturally present in the cocoa bean, of fats other than that naturally present in the cocoa bean, and of cocoa shell in powder form, should be absolutely excluded from any article which is to be sold under the name of "chocolate."

At the present time a mixture of cocoa with sugar and starch cannot be sold as pure cocoa, but only as "chocolate powder," and with a definite declaration that the article is a mixture of cocoa with other ingredients. Prosecutions are constantly occurring where mixtures of foreign starch and sugar with cocoa have been sold as "cocoa," and it seems, therefore, a proper step to require that a similar declaration shall be made in the case of "chocolate" which contains other constituents than the products of cocoa nib and sugar.

Mr. Beaumont Hart has traced a hitherto unrecorded source of metallic impurity in the presence of copper in some samples of gelatin. In his communication to the section he stated that some pressed beef, alleged to have caused symptoms of poisoning, when microscopically and bacteriologically examined was found to be quite sound, but a small quantity of copper was detected, the origin of which was eventually traced to the gelatin used as a garnish, the results being as follows:—

Pressed beef (1)	..	..	..	..	34 mg. of copper per kilo.		
" (2)	..	..	..	..	0	"	"
Jelly preparation	..	..	..	..	60	"	"
Gelatin (A) ..	..	..	..	..	25	"	"
Gelatin (B) ..	..	..	..	..	104	"	"

The examination of a number of samples of gelatin sold for household use gave results varying from 0 to 56·3 milligrams of copper per kilo, and the figure varied directly with the ash.

Dr. J. M. Alvahary read a paper on the presence of oxalic acid in cocoa and chocolate and described in detail his method for estimating the amount present. He considered that both cocoa and chocolate are rich in oxalic acid.

In the Pharmaceutical Section, W. Harrison Martindale communicated a paper on the organic arsenic compounds. He reviewed the numerous relatively non-poisonous organic arsenic compounds which have been tried up to the present time. He suggested the use of allied substances which hitherto had not been tried in medicine, and discussed sodium methyl arsenate and the cacodylic bodies, which, owing to their being little attacked in the system, have been discarded in the treatment of disease. Phenyl cacodyl compounds in general were toxic. He drew attention to the fact that inorganic arsenic is slowly eliminated, whilst such substances as the arsenilates pass off rapidly, but nevertheless in



so doing they are not void of unpleasant after-effects. The introduction of sodium arsenilate has been a distinct advance, but not an ideal. The  $\text{NH}_2$  grouping has been stated to be an essential adjunct to arsenic in combating trypanosomes.

R. R. Tatlock, in the Analytical Chemistry Section, read a paper on the expediency of appointing a general international permanent committee to secure uniformity in method of analysis, and in the interpretation of results. He said that hitherto the efforts made to arrive at unification have been confined to analytical methods as such, and have not dealt with the interpretation of results, in which, in numerous instances, the views and practice even of eminent chemists are "wide as the poles asunder," with the consequence that the profession of the analyst is discredited in the eyes of the public. As examples, he said there were not many subjects on which more labour has been bestowed, and more elaborate treatises written, than the analysis of water, but that the accuracy and refinement attained were frequently rendered valueless by their interpretation.

"Some analysts do not hesitate to give a report upon the suitability of a water for dietetic purposes, based entirely upon the results of the chemical analysis; others require, in addition, a bacteriological examination, and there are chemists who consider it absolutely necessary to make an examination with regard to the source and history of the water. There are analysts who assume that the nitric nitrogen, even when present in considerable proportion, is of little or no significance, but there are probably more who consider it a valuable indicator of possible danger. Then the question of the condition of water, such as that of a stream or tidal river, in relation to fish life, does not seem to be disclosed by any or all of these three forms of examination, and it has been found necessary to give these only a secondary place, and to resort to the determination of the amount of free oxygen, the rate of the absorption of oxygen by the organic matter present, and the facility with which the water absorbs oxygen from the atmosphere. There can be no doubt that in some cases the misinterpretation of the significance of nitric nitrogen in potable waters has given rise to serious consequences, and it would be of the greatest importance to have a decided and authoritative statement with regard to its import if present in appreciable proportion.

"Another subject on which there is much divergence of opinion as regards the inference from the results is vinegar. It has been the practice of some chemists to demand that the residual products of the acetous fermentation must be present before the article can be accepted as malt vinegar, which of course disqualifies distilled malt vinegar. There are not a few also who affirm that the source of the acetic acid in certain samples is wood, although this is merely an inference from their figures, and not the result of a direct chemical test.

"There are few questions with regard to interpretation of results that have given rise to more controversy than those relating to brandy, whisky, rum and gin, many analysts of eminence holding that a standard or limit based upon analytical figures is absolutely unsuitable, while others have no hesitation in adopting arbitrary standards for any or all of these. Even if such standards were suitable, and were adopted, they must necessarily be exceedingly low ones, and must give rise to the grossest sophistication of the genuine article by more or less characterless alcohol. These remarks apply to all the four subjects referred to.

"Even at the present time there seems to be little unanimity on the part of analysts of butter, as to how the results in certain cases should be interpreted. Some have taken the position that although no single figure may prove admixture or adulteration, the relation or balance between two or more of the constituents may disclose it, and no doubt this would be a reasonable enough view if the ratios found were outside experience with genuine butters, but this condition has not always been observed.

"A further instance of want of uniformity in the interpretation of results is that of the so-called fruit wines. There are chemists who demand that these non-alcoholic beverages shall have no other source, either wholly or partly, than the juice of the particular fruit whose name they bear. Others again are satisfied with what they call a substantial proportion of the particular fruit juice.

"It is scarcely surprising that there should be such divergency of opinion with regard to what ought to be legitimately inferred from the figures of analysis, because in many instances no inference at all can be made. For example, we may have the very best brands of genuine cognac brandy showing exactly the same composition, by analysis, as genuine high-class pot still malt whisky, or even genuine pot still Jamaica rum, and in such cases it would be impossible to state which was the one or the other, without tasting and smelling them, and only by these means can we determine to which the arbitrary standards for brandy, whisky, and rum respectively are to be applied. Seeing that chemical analysis may not be able to distinguish between the one or the other, it must be hopelessly impossible to determine the quality by its means.

"Another example of this is butter, the best quality of which will often show less volatile acids than a very poor quality."

What he pleaded for was the appointment of a General International Permanent Committee or Commission, to secure not only uniformity in methods of analyses, with which already great progress has been made, but also in the interpretation of results. The present Commissions would naturally be incorporated in this wider scheme.

The following contributions from the laboratories of the General Chemical Company of New York are useful :—

## I.—THE DETERMINATION OF SMALL AMOUNTS OF ARSENIC BY THE GUTZEIT METHOD.

A detailed description, with diagram, of an improved apparatus and method for use in the determination of small amounts of arsenic by the Gutzeit method. The test paper used is sensitised with a  $\frac{1}{2}$  per cent.  $\text{HgCl}_2$  solution. The standard stains are made from a standard *arsenate* solution, coated with paraffin and sealed in a glass vessel over  $\text{P}_2\text{O}_5$  to prevent deterioration. Development of the stains with  $\text{NH}_4\text{OH}$  or  $\text{HCl}$  is unnecessary.

## II.—THE DETERMINATION OF MINUTE QUANTITIES OF ARSENIC IN BRIMSTONE.

Brimstone is oxidised by a mixture of three volumes of carbon tetrachloride to two volumes of pure bromine, followed by nitric acid. A little water is added and the nitric acid and carbon tetrachloride removed by evaporation. Arsenic is then determined in residue by the Marsh or Gutzeit methods.

## III.—THE DETERMINATION OF ARSENIC IN SULPHURIC ACID.

Arsenic, when more than 0.002 per cent. is present in concentrated sulphuric acid, is reduced by tartaric acid. The excess of the latter is removed by heating, and the  $\text{As}_2\text{O}_3$  titrated with standard iodine solution, after neutralisation with ammonia and bicarbonate of sodium.

IV.—THE DETERMINATION OF  $\text{SO}_2$  IN DRY GASES.

Orsat apparatus made available for the purpose by use of chromic acid in concentrated phosphoric or sulphuric acid solution.

## V.—NOTE UPON MARSH OR GUTZEIT TESTS.

Presence of impurities such as lead in the zinc used in the Marsh or Gutzeit tests sometimes causes suspension of hydrogen evolution. Addition of a colloid to the acid solution counteracts this and facilitates even evolution of hydrogen.

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## Reviews.

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**THE RECTUM, ITS DISEASES AND DEVELOPMENTAL DEFECTS.** By Sir Charles B. Ball, M.Ch., F.R.C.S.I., Hon. F.R.C.S.Eng. London: Henry Frowde and Hodder and Stoughton, 1908. Pp. 332, 5 plates and 181 figs. Price 30s. net.

This is a work that is certain to take a high place among the standard authorities on the subject of which it treats. It is admirably clear and readable, complete without being too bulky or overloaded with unnecessary detail, and gives most valuable practical teaching based on the author's long and extensive experience. The earlier chapters, describing the anatomy and embryology of the rectum, its developmental defects and the methods of examination and diagnosis of rectal disease, are of special interest and importance, and we note that the author has little faith in specula, preferring to trust to information obtained by the sense of touch. Inflammatory affections of the rectum and their results occupy several chapters, and here special attention may be directed to the method recommended for the operative treatment of fistula, in which older methods so often prove unsatisfactory. The author seems inclined to endorse Mr. Harrison Cripps' theory that a firm fibrous stricture of the rectum may be brought about by long-continued muscular spasm, a process that is difficult to understand. Possibly, the true explanation is that both the spasm in the early stages and the stricture later are due to chronic inflammation in the bowel wall. The author's operation for internal piles seems a decided improvement on the ordinary text-book procedures.

Malignant disease and its treatment are fully dealt with, and here the operation suggested for perineal excision has the advantages of avoiding contamination of the wound and leaving the sphincters and their nerve supply uninjured. Colotomy and the indications for it are well described, and a novel method of attaching the bowel to the abdominal wall is recommended. In the concluding chapters foreign bodies, injuries, pruritus ani and other neuroses, and rectal diverticula are described.

In a work of this nature it is perhaps inevitable that there should be some blemishes, but these are in the present instance few and trifling. We note (on p. 2) a reference to "the inner border of the third or fourth sacral vertebra." A milk diet is spoken of as leaving a very small faecal residue. No mention is made of tying a large tube into the rectum after excision, and in one place the author speaks of dividing the rectum through the cancerous mass in the course of an excision by the sacral route, removing both diseased ends subsequently.

The illustrations are very numerous, and it is impossible to speak too highly of them. They form a most important feature of the work and are remarkably clear and well reproduced. Many of them have been drawn from stereoscopic photographs, and the results are a decided improvement on the ordinary direct reproductions of photographs.

The book is one that we should strongly recommend every surgeon to

read, and, as rectal troubles are so common in the Army, it is of particular interest to all medical officers.

THE RUSSO-JAPANESE WAR. MEDICAL AND SANITARY REPORTS FROM OFFICERS ATTACHED TO THE JAPANESE FORCES IN THE FIELD.

This is the fourth volume of reports by officers attached to the Japanese and Russian forces in the field, published by the General Staff last year.

It contains forty-seven reports and a number of maps, sketches, and photographs. Their chief interest and value consist in the fact that they were written in the field, or prepared from notes made on the spot, and that the facts came under the direct personal observation of officers whose duty it was to study closely and in detail the various conditions affecting health and medical services during the campaign in Manchuria.

All except ten of the reports are by Lieutenant-Colonel W. G. Macpherson, who was the only medical officer of any foreign army present with the Japanese army throughout the campaign. Two other medical officers, Dr. Matignon from France and Captain Lynch from the United States, arrived in Manchuria shortly before the battle of Mukden, and each of them have presented admirable reports. But the special value of the reports of the British medical *attaché* is that they cover a much wider area of personal observation, as he was with the second army during the whole of the operations from August, 1904, till peace was declared in September, 1905, and was present throughout the battle of Liao-yang with the second army; with the 6th division during the battle of the Sha-ho, and the first half of the winter when the division was holding the line of the Sha-ho opposite the Russian trenches; and with the 5th division during the battle of Mukden. While with these divisions he had constant opportunities of seeing the work of the regimental medical service, bearer companies, and field hospitals during severe and prolonged fighting, and, in addition, he was permitted by the Japanese authorities to enter and remain in Port Arthur in January, 1905, in order to study the condition of the Russian hospitals after the siege. He was thus in the position of being the only independent observer of the medical and sanitary conditions there at that time.

The first and longest report is on the field medical service of the Japanese army, with a translation of the field medical regulations, showing the organisation under which the Japanese medical service worked during the war.

Then follow a series of reports detailing the facts connected with weather, casualties, movements and work of the medical units during the battles of Liao-yang, the Sha-ho and Mukden, effects of cold during the battle of Hei-kou-tai, medical arrangements of both the Japanese and Russians during and after the siege of Port Arthur, and other reports dealing with operations in the field. In connection with Port Arthur there is a statistical analysis of 2,080 wounds treated during the siege in one of the Russian hospitals, and a series of notes on the clinical symptoms of scurvy as seen in the Russian hospitals, when at the time of the capitulation "there were about 8,000 cases of this disease, exclusive of a very large percentage of scorbutic complications in an almost similar number of patients admitted for wounds." In this report it is claimed

that there was a very close resemblance between the scurvy of the Russians and the beri-beri of the Japanese.

A report on Japanese casualties includes a table comparing the admissions and deaths from wounds and diseases amongst the Japanese with the statistics of the British troops in South Africa during the Boer War. This table brings out some facts which the public press, including the medical press, do not appear yet to realise, namely, that the mortality amongst the Japanese from enteric fever and dysentery was as great as amongst the British; and that the favourable proportion of deaths from disease to deaths from wounds amongst the former was due, not to less disease, but to an infinitely greater number of killed and wounded. The admissions for wounds amongst the Japanese are estimated to have been at the rate of 391·6 per 1,000 per annum, and only 34·2 amongst the British; while deaths from wounds were 137·3 as compared with 14·4 per 1,000. The Japanese deaths from disease were 41·2 per 1,000 as compared with 24·4 per 1,000 among the British, and the deaths from enteric fever and dysentery in the ratio of 16·8 as compared with 16·5. These facts present a totally different aspect of the comparisons made regarding diseases of the Japanese and British troops from that which has been generally presented to the public hitherto, both in this and other countries. Such prevalent opinions—as that the Japanese had little or no enteric fever, that they were free from enteric fever because they had excellent sanitary organisation and boiled the drinking water, or that they were immune as a race, or, again, that they did not have enteric fever because they lived on rice—and many other statements made by medical men and others, are disproved by these statistics, which are based on official and expert information and not on hearsay or journalistic statement.

Another series of reports deals with the medical services and establishments in Japan itself, including accounts of the marvellous expansion of the garrison hospitals in the country for the reception of sick and wounded from the field. Garrison hospitals in Japan normally contain 300 to 500 beds. During the war they were expanded to 10,000 or 15,000 beds each, by an excellent arrangement of huts, of which several photographs and block plans are given. The necessity of expansion of this nature requires to be realised in our own country, and an important lesson is consequently to be learnt from these reports in this connection.

There are twenty-one reports dealing with Japanese sanitary regulations and sanitary conditions. The exceptional precautions taken by the Japanese to prevent epidemic disease being conveyed to Japan by troops and articles returning from the field are noteworthy, and the detailed reports on quarantine stations show the extent to which precautions were taken. Amongst other matters of interest are the reports on Japanese filters, on the use of creosote as a prophylactic, and on the meteorological conditions of the campaign.

**THE SANITARY OFFICER'S HANDBOOK OF PRACTICAL HYGIENE.** By Major C. F. Wanhill, R.A.M.C., and Major W. W. O. Beveridge, D.S.O., R.A.M.C. London: Edward Arnold. Pp. viii., 151. Price 5s. net.

We experience some difficulty in reviewing this book, as it presents no views or opinions of the editors, but is merely an eminently readable and concise statement of laboratory methods. It is essentially an *aide-*

*mémoire*, and for the man in a hurry will be found most useful. In size and shape the book is handy, a commendable feature being the inter-leaving of blank pages for notes and supplementary details. The volume gives the impression of having been passed hastily through the press, as notable errors occur in many places, while some mistakes are suggestive of something more than careless proof-reading. Thus, on p. 40, we note that a hydrometer is recommended to be tested in distilled water at 4° C.; here, surely, there has been some confusion of ideas. Again, we do not like the spelling of Westphal with an *f*, while the method of using a Westphal's balance, as given on p. 131, is not only unintelligible but quite wrong. Recognising, as we do, the difficulties in editing a book of this kind, we do not wish to be unduly critical, but it is a pity that these errors have been overlooked. We think the volume will meet a want as a ready reference book, and for the wanderer, unable to carry about a large library, will be invaluable, provided he has learnt the subject from the larger text-books.

R. H. F.

**THE DIAGNOSIS OF SMALL-POX.** By T. F. Ricketts, M.D., B.Sc.Lond., M.R.C.P.Lond., D.P.H., Medical Superintendent of the Small-pox Hospitals, and of the River Ambulance Service of the Metropolitan Asylums Board. Illustrated from photographs by J. B. Byles, M.B., B.C.Cantab., F.R.C.S.Eng., D.P.H., Senior Assistant Medical Officer at the Small-pox Hospitals of the Metropolitan Asylums Board. With 12 coloured plates, 110 black-and-white plates, and 14 charts. London: Cassell and Co., Ltd., 1908. Pp. 154. Price 21s.

We find it difficult to express sufficiently highly our admiration of this book. We know of no work on the subject equal to it in medical literature. Both the excellence of the numerous illustrations and the scientific accuracy and lucidity of the letterpress are equally worthy of praise. It is a book which no medical officer of health and no specialist in infectious diseases can afford to be without, and one which every medical practitioner ought to make a point of seeing. With many, to see will be to possess.

We are at once struck by the wealth of illustrations. This book of 154 pages contains 12 coloured plates, 110 plates in black and white, and 14 charts, and yet the illustrations are such magnificent portrayals of the disease and of diseases which have been mistaken for it, and so aptly illustrate the points the author wishes to bring out, that the book does not appear in any way overweighted by its abundance of pictures. The twelve coloured plates are reproduced by the Sanger-Shepherd three-colour process, a process which should have before it a great future in the illustration of scientific works. There will no longer be any excuse for the production of the colour plates so often found in books on dermatology, which, having been drawn by artists with no medical knowledge, are only too often more misleading than accurate. The coloured plates in this work are strikingly faithful representations of the eruption of small-pox in its different stages. The book also contains a number of half-tone plates which are intended to be examined by means of a stereoscope a method of inspection particularly suitable where illustrations of this disease are concerned.

So much for the illustrations; the letterpress will be found no less worthy of repeated study. There are set down carefully, judiciously, and scientifically the factors which the writer's vast experience of the disease leads him to consider the most important guides in coming to an accurate diagnosis. He is, we are glad to note, careful to point out that the diagnosis is not to be based on any one factor alone, but each case must be carefully studied and the different diagnostic points taken together for consideration. "Faith must never be pinned to one part of the evidence only."

The book is largely based upon two original main arguments. The author points out that in years gone by, when modified small-pox was the exception, the accepted teaching gave preference to the character of the focal or typical small-pox rash as the chief diagnostic factor to be considered; but now, when modified small-pox is the rule, "the evidence from position, there can be little doubt, is in most cases more intrinsically valuable than the evidence from character; it is certainly the more easily observed and the more generally dependable." This point—the distribution of the eruption—the writer regards as *the* diagnostic criterion of the greatest importance, and he has, as he states, in this work "lifted it from a subordinate to a leading position." We have nothing but admiration for the way in which the author elaborates this, the evidence from case after case which he brings forward in his search for a general law to explain the frequently puzzling variations in the distribution of the eruption, with the final deduction that "the factor common to all cases is a disturbance in the balance of the cutaneous irritation." The crowded clusters of pustules which appear more thickly in some parts of the general field of the eruption are shown to be due to local irritation, and illustrations are given exemplifying this; cutaneous injuries, local patches of skin disease, the pressure of a garter, of a collar stud, of the corsets, the irritation of a mustard leaf, the friction of the neck-band or collar, of the under-clothing, of a button, of a tool, of tight boot-laces—are all illustrated as being the determining factors of an increased local outbreak of pustules. If the theory that cutaneous irritation is the exciting cause of the local incidence of the rash is true, the converse should hold good; parts of the skin naturally protected, such as the armpits and the inner aspects of the arms, should show a smaller amount of eruption than those parts exposed to injury or friction, such as the face, the outer surface of the forearm, &c. This is shown to be true; many illustrations are given to prove it, and one of the most puzzling factors in the disease is explained away. The author goes on to show that this law governing the distribution of the rash is more characteristic of small-pox than of any other disease, and is therefore particularly valuable from the point of view of diagnosis.

The other original thesis brought forward in this book, and one which underlies its whole teaching, is that small-pox is a "dual disease"; it has two distinct fundamental stages. The first stage is one of toxæmia lasting about a week, and during this stage toxæmic rashes of one kind or another may appear. The disease may be fatal during this period, as in hæmorrhagic small-pox. This part of the disease—"this variolous toxæmia is precisely analogous to that of scarlet fever," and the toxæmic rashes are analogous to the rash of scarlet fever. The peculiarity of small-pox is that in addition to this toxæmia we have the eruption of the characteristic focal rash, often slight in amount, but sometimes in itself



so severe as to bring about a fatal termination. And with this stage comes the secondary fever—a fever of suppuration. The author also makes valuable contributions to the pathology of the eruption, and deals fully with the initial rashes, with hæmorrhagic small-pox, with modified small-pox, and with the various diseases which may bear a close resemblance to the disease. The plates illustrating chicken-pox—the disease most often mistaken for small-pox—are particularly good.

To conclude, this book is a very important addition to epidemiological literature, one which can be read with profit again and again, and is, above all others, *the* book of reference on the subject with which it deals.

H. A. L. H.

COMMON DISORDERS AND DISEASES OF CHILDHOOD. By George Frederick Still, M.A., M.D.Cantab., F.R.C.P.Lond. London: Henry Frowde, Hodder and Stoughton, 1909. Pp. xii., 731. (Oxford Medical Publication.) Price 15s. net.

This work is the outcome of a course of lectures on Diseases of Children delivered by the author at King's College Hospital, and forms one of the Oxford Medical Publications.

Dr. Still is so well known as an authority on the diseases of children that anything from his pen is sure to be both interesting and instructive; the present work is both, and we have read it with much pleasure.

The earlier chapters are devoted to a short account of the growth and development of the infant, followed by chapters on infant feeding, natural and artificial. Chapter II., treating of breast feeding and its limitations, contains a section on wet nursing which will prove helpful to those who may have to perform the difficult task of selecting a foster-mother.

Chapter III. contains a very complete account of the various methods in use for modifying cows' milk; the author makes some eminently wise remarks on "laboratory modifying" with which we cordially agree.

Chapters VII. and VIII. deal with rickets and infantile scurvy, and Chapters XV. to XVII. with various intestinal disorders, and that somewhat rare condition—congenital hypertrophy of the pylorus.

Chapter XXIII. considers the problem which, as the author states, is only too familiar to those medical men who have much to do with children, namely, the fever for which no explanation can be found; and illustrates it with several interesting cases and temperature charts.

In Chapter XIX. Dr. Still emphasises the fact, which has only recently become well known, that one of the commonest sites for thread worm is in the appendix.

Chapters XXI. to XXV. deal with affections of the larynx, bronchi, and lungs, followed by chapters on tuberculosis, pulmonary, abdominal and meningeal.

Next follow chapters on rheumatism and heart disease, the section on treatment in heart affections being particularly excellent.

Chapter XXXVI. on nervous children might be read with advantage by all parents and those having charge of children. We consider this one of the best chapters in the book. The next chapter, on habit spasm, can also be commended.

Enough has, we think, been written to show the comprehensiveness of the work under review, which contains in all forty-eight chapters.

The sections on treatment are unusually full, and contain just those facts which are most likely to prove useful to the medical man in his daily work.

The book is well bound and printed on good paper; it is, however, rather heavy to hold comfortably. The illustrations, although not numerous, are good, and there is an excellent index.

O. L. R.

**THE RE-EDUCATION OF SELF-CONTROL IN THE TREATMENT OF THE MORPHIA HABIT.** By Oscar Jennings, M.D. (Paris). London: Baillière, Tindall and Cox, 1909. Pp. 31. Price 1s. net.

This pamphlet is an introduction to the author's book "The Morphia Habit and its Voluntary Renunciation," published by Messrs. Baillière, Tindall and Cox. Dr. Jennings is well known by his work on this subject, given in his book and in contributions to the medical press, both in England and France. As he points out, "The indifference of medical practitioners in England to the question discussed in the volume is notorious. The morphia *habitué* is not the willing slave so generally supposed. Very often he is the victim of medical carelessness or ignorance, and it is nearly always the want of suitable guidance and the discouragement consequent on ill-success that keep him in bondage." The keynote of the pamphlet is the patient's own conviction of the necessity of giving up morphia, and an earnest desire to be cured. Renunciation must be effected chiefly by restoration of will, and nothing can be worse than restraint or compulsory suppression.

The therapeutical methods used by the author are touched upon. The pamphlet will well repay perusal by medical officers. It contains useful and instructive suggestions for dealing with cases that have lapsed into this vicious habit. It is well printed, and written in a clear and scholarly style.

F. M. M.

**STUDIES ON IMMUNISATION AND THEIR APPLICATION TO THE DIAGNOSIS, AND TREATMENT OF BACTERIAL INFECTIONS.** By Sir A. E. Wright, M.D., F.R.S. Archibald Constable and Co., Ltd. 16s. net. Pp. 490.

"The Physician of the Future will be an Immuniser." With this "apology" the author presents his "Studies on Immunisation." The book is a collection of published papers from various sources and by various investigators, but chiefly by the author himself or in conjunction with other workers. The idea of the book is to present consecutively the steps by which the author has arrived at his present conception of vaccine-therapy, and the ultimate aim is to submit that the principle of phylactic inoculation—that is to say, the principle of building up the resisting power of the system against any microbe which may have entered the body—will ultimately hold its own even against the principle of warding off infection from the susceptible patient."

The method of presenting a succession of separate papers is, as the author himself states, open to criticism, and its chief value would seem to lie in the historical interest attached to these classics on immunity. The defect in this method is, however, completely remedied by the very complete index which is appended, and by which the author, as stated in the preface, replies to certain of his critics, by using it as a finger-post to an impersonal reply in the text.

Part I. deals with the antibacterial elements of the blood fluids—agglutinins, bactericidins and opsonins.

Part II. deals with therapeutic immunisation in general and in relation to certain diseases in particular. The last chapters, written in the author's characteristic style, are intensely interesting reading.

J. C. K.

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## Current Literature.

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**Use of Serum-therapy in the Treatment of Cerebro-spinal Meningitis in the French Army.**—A circular, dated April 5th, 1909, has been issued by the French War Office authorising the use of anti-meningococcus serum in the treatment of cerebro-spinal meningitis. The method of using it is as follows:—

(1) It will be injected into the arachnoid cavity, and not subcutaneously, under the strictest antiseptic precautions.

(2) The puncture is made in the middle line of the spinal column in the lumbar region, at a point where the horizontal line between the crests of the ileum intersects it, corresponding to the space between the third and fourth lumbar vertebræ.

(3) A quantity of cerebro-spinal fluid, slightly in excess of the amount of serum to be injected, is withdrawn, and the serum injected from tubes kept in water at a temperature of 38° C.

(4) After injection the patient's head is lowered and the hips raised; he is kept in this position for about two hours to enable the serum to be diffused.

(5) The dose varies from 20 ccm. to 40 ccm. in an adult.

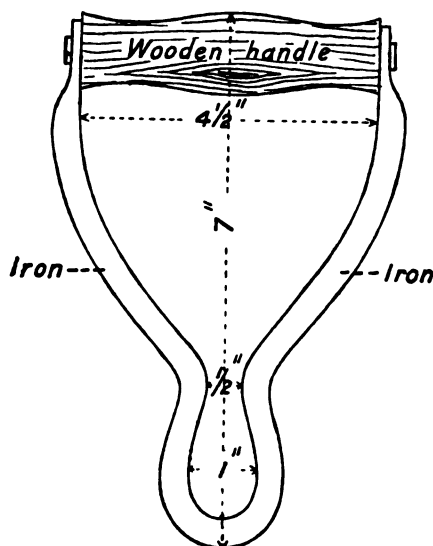
(6) In severe cases the higher doses are injected daily for three or four days. Subsequent doses will be determined by the results.

(7) In slighter cases the smaller doses (20 ccm. to 25 ccm.) will be sufficient to relieve the symptoms; but if they return after twenty-four hours the injection will be repeated, and also on subsequent days if necessary.

W. G. M.

**Stretchers of Saddle Blankets.**—In the *Deutsche militärärztliche Zeitschrift* for January 5th, 1909, Dr. Hans Petzsch describes an interesting addition to the list of blanket stretchers. He has invented handles which look very like the handles on certain gymnastic extension apparatus, or the ordinary handle of a spade. These handles are fixed on to the blankets on which the patient has been placed, two at the head end, two at the feet end, each pair being held by a bearer; a handle is also fixed on either side of the patient and grasped by an attendant. The iron loop on the handle runs down to a rounded point, and about 4 inches from the end has a constriction of about 1½ inch broad. A portion of the blanket is stuffed through the constriction, and a wooden marble or stick or stone is thrust in, thus fixing the handle to the blanket. The inventor claims that these handles can be applied to any blanket, that they do no damage, and that they can readily be improvised by

a shoeing-smith if he is given a pattern. The handles should not be applied near the border, but as near the patient's body as possible, thus leaving the free ends available for covering the patient. As described it is most comfortably carried by four bearers with six handles. If bearers are scarce it can be turned into a stretcher for two bearers by slipping two poles through the handles on either side of the patient.



ONE-THIRD NATURAL SIZE.

The writer then further applies this principle to stirrup-irons; these have open foot rests and are applied to blankets, three on each side; poles are now run through and a complete stretcher is formed. He shows a picture with four such stretchers loaded and fixed on to cross poles in a country cart. The whole arrangement looks very neat and ingenious, but would not be applicable to our equipment, as the foot piece of our stirrup-iron is solid and not hollow. The drawing is a sketch of the handle as described by Dr. Petzsche. The resemblance to a stirrup is readily recognised.

W. G. M.

**The Technique of Chloroform Administration in Connection with Military Surgery.**—In the *Deutsche militärärztliche Zeitschrift* for January 5th, 1909, Stabsarzt Dr. Merrem contributes an article on the technique of chloroform administration under service conditions.

After discussing the physiological action of this drug, its dangers and the correct methods of administering it, he contends that the three following points are necessary for its successful use in the field:—

- (1) The purity of the chloroform.
- (2) Sufficient air.
- (3) Preparation of the patient.

Chloroform is deteriorated by sunlight and electric sparks.

In peace time the residue left in the bottle after an operation, he says, should not be kept for operations on a subsequent date. In the field equipment it is put up in brown bottles, and will keep fresh up to fifteen months if not exposed to sunlight.

Great care should be taken in selecting an operation room on service, where sufficient ventilation can be guaranteed.

Under the third heading he discusses the usual preparation of the patient. Chloroform retains its advantage in the field over ether on account of the inflammability of the latter, and of the greater amount that would have to be carried.

No fresh point appears to have been raised in this article.

W. G. M.

**The Army Medical Organisation of Holland.**—Oberstabsarzt Dr. Neuburger spent two and a half weeks of his leave in Holland visiting a number of garrison towns in order to study the army medical arrangements, and gives many interesting details of this journey, in the *Deutsche militärärztliche Zeitschrift*, of January 20th, 1909. The hospitals, barracks, and other military institutions to be visited were specified in a permit from the Dutch Government. He gives a few introductory notes on the Dutch army in general. The army was reorganised in 1903. Universal service was introduced in 1898, but only about 35 per cent. of men liable were selected, on account of financial considerations. The standing army is made up of volunteers and conscripts: most of the volunteers go into the cavalry, attracted by the more flashy uniform. The liability to service extends over eight years; infantry serve with the colours eight and a half months, and mounted troops eighteen to twenty-four months. By going through a winter course in drill, &c., at the age of 16, or taking out evening classes under N.C.O.'s on payment, recruits, on passing an examination, are allowed to materially curtail their period of service with the colours. A further advantage of passing this examination is that a recruit can select the unit and station in which to serve.

Further service is required of a period of four weeks every other year in the infantry, the cavalry men only require to come out once for six weeks. Then follow seven years in the Landwehr, during which period infantry, artillery and engineers require to put in six days training on two occasions; cavalry and field artillery are transferred direct to the Landsturm.

Medical examinations are carried out at all military hospitals in March every year. Recruits who believe themselves unsound can be examined beforehand by a mixed board consisting of an army medical officer and a civil surgeon, whose findings are taken as final. Recruits for the infantry begin their training in March, while those for the cavalry are not called out till October. An unpopular arrangement is that a certain number of recruits are balloted for to serve another four to six months with the colours to meet the requirements of ordinary fatigues; an exchange by purchase, however, is permissible.

The writer then gives briefly the composition of the Dutch army and places their number at 30,000 on a peace footing and 210,000 on a war footing. The barracks are then described. He was favourably impressed with the buildings and the general arrangements, and in particular with the ample provision for bathing.

He enumerates the punishments to which soldiers are liable, which run from being forbidden to carry arms for a certain period, up to being put in chains and fed on bread and water. In addition they can be transported to the reformatory at Flushing. This institution, like the civil prisons, has a medical officer attached, usually an army surgeon who is a mental specialist, and whose duty it is to watch for any signs of insanity.

The writer describes briefly the uniform and equipment of the soldiery and touches on the education of officers. Officers are allowed to wear mufti after 4 p.m.; the doctors, however, are allowed to change after midday.

After describing a parade which he witnessed, he states that the country round about Amersfoort is used in particular for manœuvring purposes, and that about every other year medical units take part in operations.

Dr. Neuburger visited an engineer camp in this neighbourhood. There also he was much impressed with the good arrangements for bathing; a good bath-house with about twenty cells had been erected with earth and boards and each bathing cell had a douche bath. The engineer officers, he mentions, build all the barracks in Holland.

The head of the Dutch Medical Service ranks as a major-general and is called "Inspecteur von den Geneeskundigen Dienst der Landmacht." The other ranks vary from first lieutenant to full colonel. Surgeons are appointed as first lieutenants on their passing the State examination. They must be under 29 years of age and unmarried, and they bind themselves for six years' service on the active list and for four in the reserve. They begin with a six months course at the military hospital at Utrecht, in the usual subjects of military surgery, hygiene, &c., and they also learn to ride. The older military medical schools at Utrecht and Amsterdam have been abolished. Promotion to the rank of captain takes place after eight years; and subsequent advancement as vacancies occur.

The army surgeons have the same rights and duties as other officers; their pay is generally higher. There are one-year courses for medical officers at the different university clinics and at some of the larger hospitals. The study of mental diseases appears to be popular on account of the various lucrative prison appointments which naturally fall to men who specialise in this subject.

German text-books are chiefly used in the study of medicine.

The army surgeon is allowed to do private practice, but no obstetrical work.

The surgeons form a corps of their own and officers are detailed for the various duties in the garrison by the senior medical officer. During manœuvres and on mobilisation, medical officers and *personnel* are attached to the various units.

Officers on the reserve come up every other year for three weeks and do duty in the military hospitals.

There are a few apothecaries who rank as officers.

The rank and file of the medical service are grouped into four hospital companies in peace time, and each company has an infantry subaltern attached for administration of the interior economy of the company. The men are mostly obtained from the conscripts, and they do their first six weeks training with the infantry before starting their hospital training. On

completion of eight and a half months service many volunteer for another four months service. Volunteers are scarce in spite of double pay. Most of the volunteers are transfers from the "*Miliz*" and many are already N.C.O.'s. They re-engage for six years. After six months service, and on passing a successful examination, they are promoted *Milizkorporal*. One must distinguish between this kind of corporal, who is passed into the reserve after his training, and the "*Korporal der Freiwilligen*" who serves for at least six years.

The company system of peace time disappears on mobilisation and the rank and file are drafted to medical units as "*Zeikenverpleger*," or sick attendants.

In addition to those already mentioned there is a further staff of hospital employees; they are all older soldiers, who have attained to nothing in civil life, and who find a modest living in hospital employment. They sign on for a year at a time; they are only meant for use in peace hospitals and are often unfit for service. They rank as N.C.O.'s and are employed at first in the smaller hospitals as corporal-cook, corporal-porter, corporal ward supervisor, who performs the duties of a wardmaster. Later on they are employed in the larger hospitals in the rank of sergeant. The writer states that, although they are primarily sick attendants, they appear to have to do a great deal of scrubbing and washing.

There are no nursing sisters.

Dental treatment at the public expense is only afforded for injury.

A number of new hospitals have been built in recent years, but in the bigger towns they are very old. The equipment for the most part is old: wooden beds, wooden tables, many instruments still have wooden handles and there are very old-fashioned bullet forceps in the instrument cases. Everything is spotlessly clean and creates a pleasing impression.

There are twenty military hospitals with a total of 2,400 beds and about twenty "*Ziekenkamer's*" with 480 beds between them. These latter are non-dieted, and are in the smaller garrison towns. In some barracks there is also a special "*Ziekenzaal*" or medical inspection room, where only cases likely to be well in twenty-four hours are detained. All other cases are sent to hospital.

The morning sick are seen at 6 a.m., usually in some room near the guard room. The inspecting officer does not appear to be provided with an orderly.

On a war footing each infantry battalion has a heavy two-wheeled ambulance wagon for two lying or four sitting cases; it also carries two panniers and ten stretchers. A new pattern wagon is to be introduced, which will carry large quantities of dressings. Each company has some sort of wheeled stretcher and a box with surgical material.

Each artillery unit has a two-wheeled ambulance wagon and a box of dressings; each battery has a smaller case of dressings and medicines.

The cavalry had formerly pack horses; but a new equipment is under consideration.

Each medical officer carries attached to the saddle a surgical bag which is provided with a sling for the shoulders, should he have to carry it after dismounting. In one wallet he carries an instrument case, and in the other personal articles. In addition, a few other instruments, &c., are carried for him in the ambulance.

The medical *personnel* attached to the troops provides, during an engagement, a *Hulverbandplaats*, or auxiliary dressing station.

Each of the four divisions of the army on mobilisation has a *Verband-plaatsafdeeling* allotted to it, which prepares the chief dressing station, and which is pitched outside the zone of artillery fire. This dressing station unit is divisible into three sections, each with five doctors, and each section has an infantry subaltern attached for administrative purposes. They are under the orders of the senior medical officer. Each section, further, has a wagon for surgical material, one supply wagon, and five ambulance wagons.

The *personnel* consists of twenty-two N.C.O.'s and men taken from the "hospital companies," and 156 stretcher-bearers. The stretcher-bearers are infantry men who have been through a two months course of drill and first aid at the hospitals. There are also assistant stretcher-bearers, attached to different units, five to a battalion of infantry and one to each of the other units, who, when so employed, wear a red brassard on the left upper arm. In the field each stretcher-bearer carries a water-bottle, smelling salts, and several tourniquets and dressings. They replenish from the surgical haversacks of the hospital corps men.

Each section of the dressing station unit is subdivided, when opened for work, in five departments, each of which is distinguished by large sign-boards of different colours. They are marked as follows :—

(1) Reception ; (2) Fit for transport ; (3) Dressing place ; (4) Operation place ; (5) Unfit for transport.

Each wounded man is given a different coloured identification tally : White = capable of transport, yellow = dressing place, blue = operation place, green = mortally wounded.

To each division belongs a field hospital of 100 beds with five medical officers. They have a surgical material wagon, a baggage wagon, and an ambulance wagon. The dressing station unit and the field hospital are under the orders of the divisional principal medical officer.

Only a proportion of medical officers are mounted, the remainder would ride bicycles. In peace manœuvres chargers are provided from the cavalry troop horses.

The Red Cross Society in Holland is not yet affiliated to the regular service. New Army Medical Regulations are being drawn up.

The writer gives a few notes on the equipment, dressings, splints, &c., and dilates on the general use in Holland of balsam of Peru in treating wounds. It is considered very valuable in the treatment of gunshot wounds, as it is not necessary to clean up the parts, nor do the attendants' hands require to be sterile ; the balsam is put up in soft metal tubes for easy transport.

He describes a method of treating fractured thighs in use in Rotterdam, which is on the lines of a double-inclined plane.

The first field dressing has a cloth covering with printed instructions for use, and has a further covering of wax paper bound with thread. It consists of two double-headed bandages, each with a folded compress sewn to the middle. They are also experimenting with a dressing invented by Dr. Nord, which is contained in a damp-proof paper box, from which the dressing is pulled out by means of a ring sewn to the end, and is thus bound round the limb ; the dresser touches the box only, and does not require to finger the dressing.



"Tabloid" medicines are not much used in peace time, but are used in the field equipment.

There are no prophylactic measures for the protection of individuals against venereal disease.

The colonial army is quite separate from the home army, and apparently recruits from volunteers from the home army.

The colonial medical equipment is stored at Batavia. Medical officers can volunteer for colonial service, and they bind themselves for a period of five years.

At Arnheim, in eastern Holland, there is a home for invalids of the Indian army. It was originally a royal palace, has a large park, and the wards are occupied by about 100 invalids, mostly old men. In the corridors there is an interesting collection of arms, paintings, and other objects from the East Indies.

W. G. M.

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## Correspondence.

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### MAKING LANTERN SLIDES FROM DIAGRAMS.

TO THE EDITOR OF THE "JOURNAL OF THE ROYAL ARMY MEDICAL CORPS."

SIR,—With reference to the letter from Major Wanhill on the above subject in the July number of the R.A.M.C. Journal, it is unnecessary to go to the trouble of preparing plates in the manner described, if one has access to a photographic dark room. The ordinary commercial lantern dry plate fixed out in hyposulphite of soda solution without previous exposure to light, washed and dried, provides a practically transparent film which is an eminently suitable surface to take writing or drawings in ordinary or Indian ink. It may be added that such drawings can be conveniently coloured, if desired, with washes of the aniline dyes used in microscopic work.

I am, Sir, &c.,

Karachi,  
July 29th, 1909.

R. L. R. MACLEOD,  
*Lieutenant-Colonel, R.A.M.C.*

Journal  
of the  
Royal Army Medical Corps.

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Original Communications.

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MEDICAL HISTORY OF THE SOUTH AFRICAN WAR.

BY LIEUTENANT-COLONEL R. J. S. SIMPSON, C.M.G.  
*Royal Army Medical Corps.*

INTRODUCTION.

DISEASE in an army in the field offers a very wide field for investigation. It is hardly possible to name any common ailment which may not be affected, either in its incidence, clinical features, or severity, by the special conditions of active service, exposure, fatigue, monotonous and at times limited diet, increased chance of contagion, and the like. Such an investigation, however, presupposes careful observation and accurate record before the results are of much value—two conditions which demand time for their fulfilment, while on active service the first essential must invariably be the speedy succour of the sick and wounded, a necessity to which all else must be subordinated.

Hence in such a campaign as the late South African War, as indeed in all serious operations where the medical staff must always be fully employed with work that cannot be delayed, it is not possible to obtain satisfactory material for the complete investigation of the effects of service on the less important ailments. Here and there individual medical officers may have been so situated as to be able to observe and record their experiences over limited areas and comparatively small numbers of men. Such observations, however, can only rarely admit of a general application, and must usually be recorded as the results of individual experience only. In the late war a considerable proportion of the medical

*personnel* had but a limited acquaintance with the varying facies of disease in Europe, and none of its vagaries in tropical or sub-tropical countries. Hence much that appeared to them to be new and important was but a repetition of the previous experiences of many observers.

The investigation of the effects of active service in the less serious diseases is, however, a matter of academic rather than of practical interest. The important questions are those concerned with the diseases which are invariably the causes of inefficiency and mortality in an army in the field—enteric fever and dysentery.

The medical history of the South African War must therefore be limited to the fullest consideration (which the material available makes possible) of those important epidemic diseases—enteric fever, its congener, simple continued fever, and dysentery; to notes on the few diseases which appear to be special to South Africa, with some reference to such minor ailments as assumed any degree of importance.

The first essential to the understanding of the disease-history of the campaign would appear to be some knowledge of the normal incidence of disease in South Africa among the garrison during peace, and in the previous campaigns in that country.

One finds, on comparing the late war with previous campaigns in South Africa, that the same general features are evident—the prominence of continued fever and dysentery, with little serious disease beyond this. Why this should be the case seems clear if the disease conditions among the civil population be considered in relation to the topography and climate.

A comparatively full account of the conditions obtaining in the civil population before the war is therefore given in the next section of this report. It is sufficient here to say that enteric fever and dysentery are endemic throughout the whole area, frequently, it is true, with a comparatively small incidence, but at times breaking out in epidemic form. No class of the community is exempt; Afrikanders as well as Europeans, black and white, all suffer from these diseases. Nor is enteric fever specially an urban disease; on the other hand, it is at least as frequent on the scattered farms as in the towns or villages; it is a constant cause of illness in the native locations, and is at times also epidemic in the native kraals.

Here we have two infectious diseases, both spread by human dejecta, and in conjunction a sanitary system which to call imperfect is almost a compliment. In every respect the systems

(where they exist) are inefficient. Provision for the efficient removal of excreta has hardly been considered ; among the native population outside the towns or locations none whatever exists, nor do the habits of the natives demand any such accommodation. Practically no steps are taken to obviate a general fouling of the ground from slop-water, kitchen refuse, and the like, while the methods of collection, storage, and distribution of water are almost without exception of the most primitive description.

From these two factors—endemic disease and imperfect sanitation—it results that it is hardly possible to select any one area of the whole covered by our operations, and say that there at least all epidemic disease must have been imported.

A third factor lay in the exceptional constitution of the field force. In most of our previous campaigns a large proportion of the force consisted of seasoned soldiers—men who had served abroad where enteric fever is more prevalent than in England, where the more susceptible were either eliminated by death or had acquired by attack a degree of immunity against enteric fever. It is, of course, the case that this point may be pressed too strongly. Before the war there was evidence that service in India, that is, a previous exposure to infection, did not result in that degree of immunity of the unit as an aggregate against enteric fever in Natal, which might have been expected to show itself had the unit remained in India, and also that, as to the individual, a previous attack of enteric fever in India was more often followed by an attack in Natal than a second attack is observed in the same individual while remaining in India, and that therefore a greater incidence than usual might be expected in seasoned units proceeding to South Africa, especially under war conditions. But apart from this, the proportion of young soldiers who had never previously been out of England was very much larger than in any previous campaign. Recruits for the Regular Forces, Militia, Volunteers, Imperial Yeomanry, all alike were young or maintaining their natural degree of susceptibility, or both.

Quite apart from the somewhat theoretical consideration of the degree of susceptibility lies the practical fact that all these young or inexperienced soldiers had everything to learn regarding their new mode of life ; all the common precautions which even the careless regular soldier takes as a matter of habit had to be learned by these men. This, too, influenced the sick-rate.

The last, and not the least, important factor influencing disease in the field is the sanitary organisation. In the South African

field force knowledge, experience, and ability were common among the officers of the medical service; but these powers were largely wasted owing partly to traditional obstacles, partly to the want of an adequate organisation and equipment. The traditional obstacles were these: sanitation was regarded as something of a mystery, which concerned the doctors alone. In the early stages of the war only a few commanding officers recognised that it was their business, and still fewer that it was not only their business but that of every man under them; experience before the war in South Africa showed that this recognition was most usually found in regiments who had served in India before arrival in Africa. That this attitude lasted to the end of the nineteenth century is partly the fault of the medical service, professional pride refusing to admit that a layman could deal with such a matter. Again, it was regarded as the primary duty of the doctor to cure a man after he had fallen sick, not to prevent him doing so, an idea taken from the relation of the doctor in civil life to his patient—another example of the persistence of civilian notions in military life. The last obstacle, which may also be termed traditional, was the position of the sanitary adviser, an adviser whose power of seeing his ideas put in practice depended on his personal influence. It is, of course, perfectly obvious on general grounds, as it is historically, that an adviser without personal influence, whose sole responsibility is the emission of recommendations on paper (of which an office copy is carefully filed) will at times allow himself to make recommendations which he should know are useless, if not impossible, and this for the sake of guarding himself against the uninformed criticism of some one at home. Such a procedure not only fails in producing any useful result locally, but throws discredit and suspicion on the whole body of the sanitary advisers.

The absence of an adequate sanitary organisation was not the fault of the medical service. "The fact was that in the medical Service, as in every other, the contingency of expansion on a really large scale had never been contemplated by the political rulers of the country, and had consequently not entered, to any extent, into the calculations of the various departments of the War Office. The medical service was not behind the other services in this respect, nor did the response which it made to the unforeseen strain compare unfavourably with that made by the other services."<sup>1</sup> The trained officers of the service were only

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<sup>1</sup> *Times* "History of the War in South Africa," vol. vi., p. 508.

sufficient to form a *cadre*, filled up from the civil profession, and relations of doctor and patient being the essential in the popular view, the available officers (other than administrative) were distributed almost entirely to the various hospitals, at the front or on the lines of communication, where part of their duties was in connection with sanitation. It must not be forgotten that this system, inadequate as it now appears, had produced exceedingly good results in former and smaller campaigns, results which were regarded with admiration by our Continental brethren.

Many hard things have been said of our sanitation during the war. We learned much during these three years; we have been learning since, and, owing to a very fortunate combination of individuals and circumstances, there is no doubt that our present standpoint is far above that from which we began the campaign. But many of the criticisms levelled against the medical service during and after the war were unjust. Some were prompted by the parochial tendency of the average man devoid of imagination; others were the habitual, probably unthinking, criticisms which we have learned to expect; others, again—the result of a supposed comparison with another nation—are known to be founded on misstatements of fact. But when the actual incidence of disease is considered in all its relations, it will be found that the results, though not such as we hope to obtain under our present organisation, are better than is generally believed, and will bear comparison with any others.

#### THE INCIDENCE OF DISEASE IN THE GARRISON OF SOUTH AFRICA PRIOR TO THE WAR.

The Army Medical Department Reports are available from 1859, and contain much valuable information, both as regards incidence and mortality. But for the purpose of a comparative statement, it is always easier to obtain accurate information as to deaths than cases, and again, in considering fatal cases only, the question of diagnosis is largely eliminated, as the diagnosis has been confirmed by an autopsy. During the forty years prior to the war covered by these reports, two quinquennia—1874-78 and 1879-83—included periods of operations in the field more or less protracted, and though these two periods require special mention, yet for purposes of comparison of normal health conditions they must be omitted. The following table, then, shows the deaths and mortality to strength for different diseases, or classes of disease, for the first and last fifteen years of the period, and this division

affords a means of comparison also between the old or long service and the young or short service army; while the diagram A shows the mortality per 1,000 of strength for each quinquennium during the period for all causes, for all disease, for all climatic disease (fevers, dysentery, and diarrhoea), and for all fevers.

COMPARISON OF MORTALITY RATES, FIRST FIFTEEN YEARS AND LAST FIFTEEN YEARS.

	1859-63 Deaths	1864-68 Deaths	1869-73 Deaths	Total Deaths	Ratio per 1,000 of strength	1884-88 Deaths	1889-93 Deaths	1894-98 Deaths	Total Deaths	Ratio per 1,000 of strength
Malarial fevers .. ..	5	3	5	13	0·21	1	—	3	4	0·07
Enteric fever .. ..	1	11	3	15	0·24	27	35	82	144	2·37
Other continued fevers ..	31	10	2	43	0·69	1	—	—	1	0·01
Enteritis .. ..	1	—	—	—	0·02	1	1	2	4	0·07
Perforation of intestine ..	—	—	—	—	—	1	—	—	1	0·01
Dysentery .. ..	21	15	5	41	0·66	2	3	13	18	0·30
Diarrhoea .. ..	8	11	2	21	0·34	—	—	—	—	—
Hepatitis .. ..	7	10	14	31	0·50	4	—	2	6	0·10
Hepatic abscess .. ..	—	1	2	3	0·05	4	1	12	17	0·28
All climatic disease ..	74	61	33	168	2·71	41	40	114	195	3·21
Tubercular diseases .. ..	36	38	35	109	1·76	12	5	18	35	0·58
Nervous diseases .. ..	27	20	18	65	1·05	11	9	2	22	0·36
Circulatory diseases .. ..	37	37	20	94	1·52	6	6	15	27	0·44
Respiratory diseases .. ..	24	22	11	57	0·92	16	8	10	34	0·56
Digestive diseases .. ..	11	3	1	15	0·24	3	3	1	7	0·11
Other diseases .. ..	14	7	13	34	0·55	14	14	15	43	0·71
All diseases .. ..	223	188	131	542	8·75	103	85	175	363	5·97
Poisons, including alcohol ..	24	15	6	45	0·72	—	1	3	4	0·07
Injuries .. ..	41	31	20	92	1·49	29	22	26	77	1·26
In action .. ..	—	—	—	—	—	2	—	2	4	0·07
All causes .. ..	288	234	157	679	10·96	134	108	206	448	7·37

## SUMMARY.

Ratios per 1,000 of Strength.

	1859-1873	1884-1898	1884-1898	
			—	+
Malarial fevers .. ..	0·21	0·07	0·14	—
Other fevers .. ..	0·95	2·46	—	1·51
Other climatic disease ..	1·55	0·68	0·87	—
ALL CLIMATIC DISEASE ..	2·71	3·21	—	—
Other diseases .. ..	6·04	2·76	3·28	—
ALL DISEASES .. ..	8·75	5·97	—	—
Other causes .. ..	2·21	1·40	0·81	—
			5·10	1·51
ALL CAUSES .. ..	10·96	7·37	— 3·59	—

The death-rate from all causes in South Africa during the fifteen years 1884-98 was 7·37 per 1,000, practically identical with that during the ten years 1889-1898, and less than the mean death-rate of all European troops at home and abroad during the same period, viz., 9·03 per 1,000. Indeed, during that period only four foreign stations—Straits Settlements, Barbados, Gibraltar, and Canada—showed a smaller death-rate, so that, as regards mortality, South Africa compared favourably with most foreign stations.

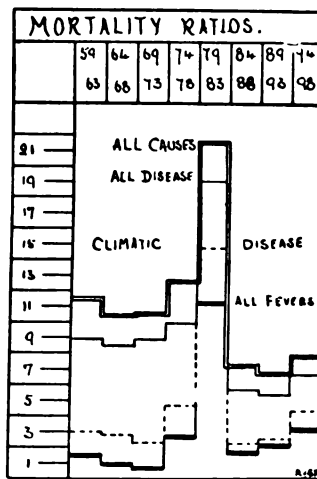


DIAGRAM A.

During the fifteen years 1859-74, the death-rate from all causes was 10·96 per 1,000, or 3·59 per 1,000 more than during the last fifteen years. From the summary given above, it will be seen that there has been a reduction of 5·10 per 1,000 in the mortality during the last fifteen years, as compared with the first; that this reduction has operated in all classes of disease except in the class of continued fevers, in which there has been an increase in the mortality of 1·51 per 1,000, making the net decrease in mortality 3·59 per 1,000. This increase in febrile diseases is practically due to enteric fever alone; the probable causes will be discussed later.

The table shows sufficiently well the differences in the general, non-climatic diseases.

As regards the climatic diseases, the general incidence as given in the Army Medical Department Reports is shown in the diagram B. Malarial fevers are not endemic and have not been



important at any time. The highest admission rate for these was during the period including the Zulu and first Boer War, 1879-83, when it reached 48·08 per 1,000 of strength, with a death-

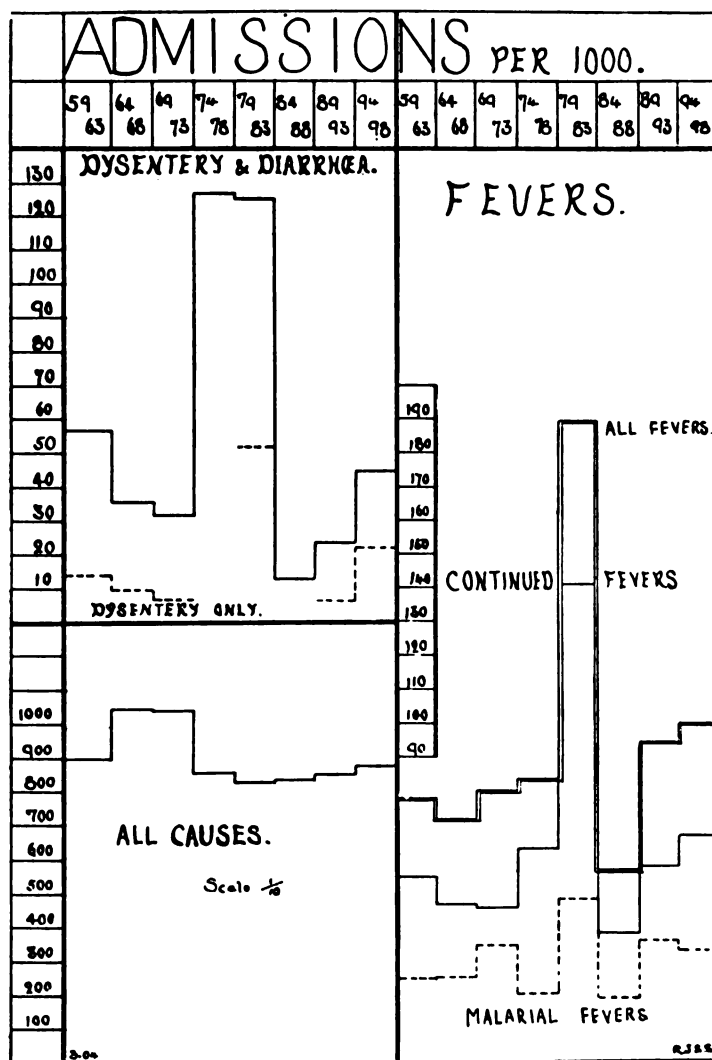


DIAGRAM B.

rate of 0·79 per 1,000. Probably many of the cases and most of the deaths<sup>1</sup> were in fact due to enteric fever. Except during this

<sup>1</sup> *Vide infra.*

period, when the coast column in Zululand probably contracted fresh infection, all the cases would appear to have been imported between 1859 and 1867, particularly in troops from China, throughout the whole period in troops from Mauritius and India, the latter source especially raising the admission rate in 1896-97.

*Dysentery and Diarrhœa.*—Here the records are imperfect, as shown by the broken line, and there appears to have been some confusion about diagnosis, judging at least from the number of deaths returned as from diarrhœa<sup>1</sup> during the earlier years. The incidence ratios for dysentery, and for this and diarrhœa combined, fell steadily during the first fifteen years of the period. During the last fifteen years, though the mean *admission* rate is about 12 per 1,000 less than in the first fifteen years, the combined incidence rate has nearly doubled in each successive quinquennium. The *mortality* is entirely from dysentery, 0·30 per 1,000, while during the first fifteen years the mortality from dysentery alone was 0·66 per 1,000, and from both diseases 1·0 per 1,000, so that in this respect there is a marked improvement. Much of the dysentery during the earlier periods occurred in the troops from China and was in all probability of a severer type than that now found. As regards the diseases associated with dysentery, hepatitis and hepatic abscess, it has not been possible to obtain the number of admissions. The increase in the mortality from hepatic abscess, with a concurrent decrease in that from hepatitis, is apparently due to a difference in nomenclature, not to any difference in the real frequencies of the two diseases in each period; the total death-rate from both combined has largely diminished.

*The Continued Fevers.*—The only way to eliminate the difficulty of diagnosis is to take all the continued fevers together; this is, however, less likely to be wrong in the mortality than in the incidence ratios. One finds in the earlier years that the continued fevers are said to have been more frequent in regiments affected by malaria contracted elsewhere, so that some of these continued fevers may have been forms of malarial fever which did not conform to the type recognised as remittent fever. Hence the statistical distinction between the malarial and continued fevers does not appear to be absolute. But one cannot say that all the deaths recorded as from malarial fevers, especially remittent fever, should in fact have been recorded as from enteric fever. In 1879,

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<sup>1</sup> Possibly some of the deaths may have been due to sprue among troops from China.

indeed, twenty-four deaths returned as from remittent fever are referred to as probably due to enteric fever, but on the other hand, from personal knowledge, two deaths occurred from malarial fever during the last quinquennium in which there was no doubt as to the non-enteric character of the disease. On the whole, however, as regards the deaths, there is less probability of serious error in regarding them as all due to enteric fever than by attempting to differentiate between them. The incidence ratios are not quite so clear, and must be considered as approximate only.

As regards the continued fevers other than enteric fever—the so-called “simple continued fever” and the like—the whole evidence is to the effect that they prevail at the same seasons and in the same localities as enteric fever, and hence that the recorded distribution of the cases of enteric fever may be taken to represent that of the other continued fevers.

*Enteric Fever.*—The incidence in proportion to strength is much greater in Natal and Zululand than in Cape Colony. Between 1882 and 1898, of 1,130 cases returned as enteric fever, 966, or 85·5 per cent., occurred in Natal; 150, or 13·3 per cent., occurred in Cape Colony; the remaining small percentage in St. Helena and Rhodesia. The exact strengths in Natal and Cape Colony respectively are not available, but it is known that the strength in Natal was rather less than in Cape Colony, so that the actual difference in incidence is greater than these figures represent. Similarly, before 1882 most of the cases occurred in Natal or the Transvaal, though a complete numerical statement for the whole period cannot be made out. There is little doubt that about four-fifths of the cases of enteric fever in South Africa during the period (certainly between 1882-98) occurred in Natal, Zululand, and the Transvaal, that is, in the region of the summer rains.

With the exception of Eshowe, at which the maximum number of cases in a year never exceeded four, and where the garrison is small, and Simonstown, as to which there is some doubt of its occupation by the army for the first few years of the period, cases of enteric fever have been returned every year from every station—permanent, new, or reoccupied—in which troops have been stationed during this period, from 1882-98. Further, during the occupation of the Transvaal, between 1877 and 1881, and the formation of small military stations in many of the towns, each of these contributed cases of enteric fever.

The fourth (1874-78) and eighth (1894-98) quinquennia of the period immediately precedes a war period, and in each there is a

rise in the total death-rate, an increase which is seen in each class of disease. These preliminary periods hence merit a special examination, of which the results are shown graphically in diagram C.

From this it appears that the increase in each of these two quinquennia was actually due to an increased incidence of disease during the last year of each quinquennium, and the detailed history of each of these periods is instructive.

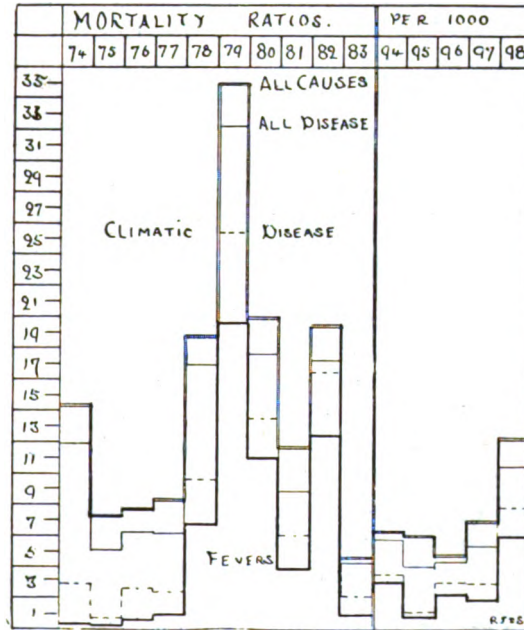


DIAGRAM C.

In 1877 the Transvaal was annexed; new stations were opened both in Natal and the Transvaal. In December of the same year, the troops from the garrison of Cape Colony crossed the Kei river prior to the beginning of the Gallaika War. During that campaign a so-called "bastard" form of enteric fever, called by some "typhomalarial" fever, prevailed among the troops engaged. It began almost simultaneously in East London, King William's Town, and Fort Beaufort, and gradually extended to the camps in the Transke and Ciskei. Most of the cases occurred in March, April, and May, 1878.

In August of the same year, preparations were begun in Natal

in view of the serious trouble with Zulus. Wood's column went to Utrecht in the same month, and an expedition was sent against Seccocoeni. All these movements had the usual consequence—an increase in enteric fever. In 1879, admissions are stated to have occurred at nearly every station (in Natal, Zululand, and the Transvaal) and on the line of march. Durban was said to have been a great focus for the distribution of the disease, and the detailed medical history of the war shows the persistence with which enteric fever occurred in an infected body of men. It is this year (1879) of the Zulu War which is responsible for the increased incidence during the period 1879-83 (diagram B) ; the succeeding years of the greater part of the period show remarkable variations.

In 1880 cases and deaths from enteric fever occurred at most stations in Natal and the Transvaal, most in the first quarter of the year.

War was declared on Dingaan's Day (December 16th), 1880, and small garrisons were besieged in Standerton, Marabastadt, Wakkerstroom, and Potchefstroom. Reinforcements arrived from England and India between January and May, 1881, and about 7,000 were encamped at Newcastle between March 23rd and the end of May, 1881. One of the most curious features of the case is the extraordinarily small incidence and mortality during this year as compared with the preceding and succeeding years. The only explanation that suggests itself is that as the reinforcements only began to arrive on January 21st, and continued arriving till May 15th, the greater part of them arrived after the season of greatest prevalence of enteric fever had passed. It may be noted here that the meteorological records show that in the last three months of 1880 the rainfall at Fort Napier, Maritzburg (which is fairly typical of that in Natal generally), had been much *above* the average, and that the fall in January and March, 1881, was about the average, the February fall being a little short. Now an examination of the conditions associated with the prevalence of enteric fever in Maritzburg seemed to show (Army Medical Department Reports, 1898) that a good and early rainy season was associated with a shortened enteric season, and conversely.

In September, 1881, some cases of enteric fever occurred among the troops encamped at Newcastle, and thence the disease gradually spread all over Natal. The date of appearance was comparatively early. One may note here also that the August rainfall was considerably above the average, which is usually small; later it was about normal.<sup>1</sup> A full account of this outbreak is given in the

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<sup>1</sup> The rainy season does not begin till the beginning of October.

Army Medical Department Report for 1881, by Brigadier-Surgeon Wm. Skeen, M.D., and is most interesting. In 1882, 240 cases of enteric fever, with forty-seven deaths, are reported from Natal; none from Cape Colony.

In 1883 the garrison was much smaller after the withdrawal of the reinforcements, and the troops remaining were "acclimatised." The result was an exceedingly low mortality from climatic disease, including all fevers; the soil had become exhausted. With this was coupled the lowest admission rate for all diseases occurring during the whole forty years (651·2 per 1,000).

In the period preceding the last war we find the same increase, but on a smaller scale. In 1897 there was a large increase of the garrison, and two stations, King William's Town and Ladysmith, were reoccupied. In the first the old barracks were available; in the second hut barracks were erected, as also in Maritzburg. In 1898 a further increase of the garrison took place, so that the average strength in that year was nearly double that in 1896 (increase 88 per cent.), while the accommodation was increased, as stated above. Following this, in 1898, we have an increase in the rate of mortality from fevers similar to that occurring under similar circumstances twenty years previously, and probably only less, both relatively and absolutely, because no operations in the field were undertaken during this last period.

It is, of course, possible to lay too great stress on the connection between the increase of the garrison and the increase of the mortality rates. There is much reason to believe that the prevalence of enteric fever in Natal in 1897-98 was not solely determined by the advent of fresh troops, but (like that in 1891, a year of exceptional prevalence) was partly, if not considerably, influenced by climatic conditions, that is, by a shortage of rainfall during the two years preceding (*vide* Army Medical Department Reports, 1898, p. 490 *et seq.*). It would appear to be more than a coincidence that the prevalence of enteric fever in the Galaika War of 1878 was preceded by a drought in Cape Colony in 1877.

But even allowing for other factors, a comparison of the rates of mortality with the annual strengths suggests that an important increase of strength is associated with an increased rate of mortality, and this irrespective of actual war conditions. This is probable on general grounds; granted a country where enteric fever is endemic, where the barrack accommodation is only calculated for a small garrison, so material an increase as occurred in South Africa during these two years must cause a strain on the existing arrangements.

When one considers the actual position in South Africa, where certainly during the years preceding the last War, and apparently also during the period preceding the Zulu war, if not during the whole interval between the two campaigns, all expenditure on military works was influenced by the idea that the garrison would be materially reduced at no distant period, one can easily understand that the existing accommodation had become deficient in many of the details recognised as necessary for the maintenance of proper health conditions, even in the small garrison then present; and further, that the plans for the additional accommodation, which had to be provided with the increase of the garrison, were prepared under the influence of the same idea—early reduction—and were therefore of a temporary and inadequate type.<sup>1</sup>

The previous history of the military forces in South Africa, more especially during war periods, showed what might be expected in the approaching campaign. Attention was directed to these points in the "Sanitary Notes," Appendix V., of the War Office Memorandum (0.79/9706) on the Medical Arrangements for the Field Force, issued in October, 1899, and the necessary precautionary measures were also pointed out. Preventive inoculation against enteric fever was also instituted.

The following table shows the distribution of the recorded cases of enteric fever in the garrison in South Africa for the four years preceding the war, and it will be seen how much less the prevalence was in stations of the Cape Peninsula (Capetown, Wynberg, Simons-town) than in the eastern part of Cape Colony or in Natal.

There is one very broad distinction between these areas. The Cape Peninsula is within the area of winter rains; 70 per cent. of the total rainfall occurs between April and October. The Eastern Province of Cape Colony, Natal, the Orange River Colony and Transvaal, all lie within the area of summer rainfall. Grahams-town is near the dividing line. It receives 50 to 60 per cent. of its total rainfall between October and March; King William's Town 60 to 70 per cent.; Natal, the Orange River Colony, and Transvaal over 70 per cent. during this period.<sup>2</sup>

Our experience in the garrison of South Africa has shown that enteric fever has only been prevalent in stations in the area of summer rains, and that its occurrence in time is associated with

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<sup>1</sup> NOTE.—This section is condensed from an article in *THE JOURNAL OF THE ROYAL ARMY MEDICAL CORPS*, vol. ii., 1904.

<sup>2</sup> "Report of the Meteorological Commission," Cape Colony, 1897.

DISTRIBUTION OF CASES OF ENTERIC FEVER.

Year	CAPE COLONY							NATAL						
	Capetown		Wynberg		Simons- town	King Wil- liam's Town	Grahams- town	Maitzburg		Ladysmith	Notting- ham Road	Mooi River	Eshowe	Fort Pine
	11	3	6	1	2	—	—	23	6	—	—	—	3	—
1896 ..	9	2	3	3	—	7	—	115	6	17	1	—	—	—
1897 ..	2	1	24	6	3	10	2	114	18	118	21	—	—	2
1898 ..	5	—	6	1	—	46	1	53	9	196	29	5	—	—
*1899 ..	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total ..	27	6	39	8	5	—	63	305	39	331	51	7	3	2

<sup>1</sup> An isolated epidemic, from polluted water.

<sup>2</sup> To October only.

Grahamstown }  
 King William's Town } Occupied May, 1897.  
 Ladysmith }  
 King William's Town. — Enteric fever prevalent in town and native kraals.



increasing rainfall. We also know that in Bloemfontein, Harri-smith, and Pretoria, all in this same area, enteric fever has been more prevalent or only prevalent at the same period. Our records during the war showed a seasonal variation of the same type, except during the unusual conditions of the cold weather of 1900.

A series of observations made in Pretoria, where the water supply was believed to be good, showed an intimate relationship between the rainfall and the number of *Bacillus coli* found in the water supply, the result of contamination at some distance from the actual point of collection.<sup>1</sup>

In the Cape Peninsula the number of cases in the garrison has been too small to admit of a satisfactory determination of the seasonal distribution, but we know that the cases of enteric fever notified in Capetown between July, 1893, and June, 1897 (which may legitimately be assumed to bear some fairly constant proportion to the total cases), did not show the same relationship to the rainfall that is found in the summer rainfall area. There is but one feature common to both areas, and that is the association of a rising temperature with an increasing prevalence of enteric fever, but what influence, if any, this has on the development of the disease is so far undetermined.

But the towns of the Cape Peninsula differ from those elsewhere, in that they have a water supply which may be regarded as to all intents above suspicion. Hence one would hardly expect to find the same intimate connection in time between the rainfall and prevalence as in areas in which the water supply is invariably polluted by surface washings.

These two facts are important—the time relations between prevalence and rainfall in the area of summer rains, and the inevitable pollution which occurs of all water supplies drawn from streams, especially at the beginning of the heavy rains, when the accumulations of organic *débris* are swept into them. From the wide-spread prevalence of enteric fever and dysentery among all classes of the population there appears to be little need to look far for the specific contamination. It is impossible to form any other conclusion but that in many instances we have in this the cause of the outbreak of these two diseases; the further development after the introduction of the infection into a body of men may of course be conditioned by many other circumstances.

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<sup>1</sup> Cf. the account of the epidemics of enteric fever at Bar-le-Duc (*Archiv. de Méd. et Pharm. Militaire*, December, 1905).

## REMARKS ON THE TREATMENT OF GONORRHOEA IN MALTA.

BY MAJOR C. E. POLLOCK.

*Royal Army Medical Corps.*

THE irrigation treatment of gonorrhœa was introduced at Cottonera Hospital in 1905 and soon after in the other hospitals in Malta. As much was hoped from this treatment, an attempt was made to record all cases so treated in order to arrive at some idea of its value in actual practice. At Cottonera and at a later period in the other hospitals case sheets similar to the attached form were kept for all cases treated by irrigation and the results entered in a register when the man was discharged from hospital. At first I thought that fairly full clinical notes of each case could be kept and the results presented in tabular form. It soon became apparent, however, that this would involve an enormous amount of clerical labour and that the result would be merely a bewildering series of figures. The enquiry was therefore restricted to the headings dealt with below.

The cases were all consecutive and in no way selected. The total number given under each heading differs, as sheets which were not complete in any particular have not been included in that group; the elimination of incomplete sheets when compiling the results of each group has added considerably to the labour of preparing these apparently simple statistics.

*Routine.*—On admission the penile discharge is microscopically examined and the result, together with that of Thompson's two glass test, is entered on the case sheet. On subsequent mornings, each man on rising passes his urine into the two glasses in the presence of the ward orderly, who then locks them up in the ward bunk till the medical officer's visit, when each man presents himself in turn with his two glasses and the orderly hands his case sheet to the medical officer. Having the clinical history of the case and the urine in front of him the medical officer can rapidly make up his mind as to what change, if any, is needed in the treatment and enter this on the case sheet. By using simple abbreviations the clerical work can be reduced to a minimum.

*Treatment.*—The treatment usually employed was as follows:—

In very acute cases the man was kept in bed till his symptoms had subsided; in the ordinary mildly acute case the man was

allowed up with his bed down, and the chronic case was kept up from the start. Diet : All acute cases were kept on milk diet with porridge and barley water till the scalding had ceased, and were then placed on ordinary diet. In a relaxing climate like that of Malta patients easily become debilitated if kept on a monotonous diet of milk (which in Malta is always tinned) ; once a patient becomes "hospitalised" he seems to be incapable of combating the gonococcus and the disease assumes a subacute form which continues indefinitely.

*Internal Medication.*—On admission a smart purge is given, and to keep the bowels acting freely white mixture is ordered in the morning. When the weather is hot and damp, white mixture has a great tendency to produce alkaline urine with copious phosphatic deposit, and when this occurs the subacute stage of the disease is much prolonged. During the acute stage I usually give 5 grains of citrate of lithium and 10 grains of urotropin three times a day. This helps to relieve the scalding, and does not seem to do any harm. When the subacute stage is reached, balsam of copaiba, sandal-wood oil, or cubebs are usually prescribed. I must say that I am very sceptical as to the good effected by these drugs, but they have a certain reputation, and their use is therefore justified, while at the same time they are so unpleasant that their administration is likely to have a deterrent effect when the soldier feels inclined to run the risk of a re-admission for the same disease. Benzoic acid, 15 grains thrice daily, has a decidedly beneficial effect when the urine is turbid, but in my experience none of these drugs given by the mouth are of much use.

*Treatment of the Urethra.*—With the rare exception of the very acute case, we use irrigation morning and evening and begin at once. This seems to me to be perfectly rational, for the only medium on which the gonococcus can be cultivated with ease and certainty is the urethral (or conjunctival) mucous membrane ; the patient is, however, not admitted to hospital for the purpose of cultivating gonococci on his urethral mucous membrane, but in order to get rid of those already there, and as soon as possible. Irrigation is stated to cause a variety of unpleasant complications, and the old surgical maxim, that an inflamed tissue should be kept at rest, is quoted as a reason for doing nothing to interfere with the growth of the gonococcus. The inflammation is rarely, however, of great intensity, and is entirely due to the gonococcus. It stands to reason, then, that the removal of the exciting agent should produce a diminution in the degree of inflammation present.

Practice supports this theoretical consideration, as it is precisely in the acute stage that the greatest improvement results from the use of irrigations, scalding quickly disappears, and chordee is rare when this treatment is followed. There are certainly a few exceptional cases in which the patients complain of pain after irrigations, and for these rest in bed and barley water flushings may be employed. The action of the irrigation is mainly a mechanical one: it washes away the gonococci and their toxins lying free on the surface, and at the same time gently massages the urethral mucous membrane, and so causes a serous exudation, which carries the gonococci lying between the epithelial cells to the surface, ready to be removed by the next irrigation. The actual drug employed for the purpose of irrigation is of secondary importance, provided the solution be weak. We make most use of potassium permanganate, 1 to 2 grains to the pint, next to that of silver nitrate, 2 grains to the pint, or albargin,  $2\frac{1}{2}$  to 5 grains to the pint. Albargin seems to exert a good effect when the urine shows a very pale haze, but, in general, it is inferior to the other two drugs.

*Standard of Cure.*—How are we to know when a gonorrhœa is cured? This, in many cases, is a most difficult question to answer. The absence of a penile discharge is of little or no help. When the discharge has entirely ceased and the urine remains clear for five successive mornings, in spite of a diet which contains a daily pint of beer, we may fairly assume that the disease has been cured, and return the man to duty. But in many cases a few threads or a little mucus persist in spite of every change of treatment, and even of stopping treatment altogether; when careful microscopic examination fails to reveal the presence of any gonococci, what are we to do? Latterly, I have stopped all treatment and ordered the man a pint of beer and 4 ounces of pickles daily for five days; if this fails to produce any increased turbidity or mucoid discharge I have returned the man to duty, and when possible have kept him under observation. Major Master, R.A.M.C., has kept a number of these cases under observation at Imtarfa, while performing their duty, and in practically every case the urine has cleared up in from one to five weeks.

With these preliminary remarks I will proceed to give my results.

*Time in Hospital.*—I have collected the sheets of 962 patients who began and finished their treatment by the irrigation method; the total number of days in hospital for these men was 34,981,

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making an average of 36·36 for each case. Included in the above were 34 men admitted to hospital for the first attack of gonorrhœa, in whom only the anterior urethra was attacked, and none of whom had a relapse after discharge from hospital; their total days in hospital were 652, or an average of nineteen days per case. Against this there were 121 of my own cases admitted for the first attack of gonorrhœa, but in whom the posterior urethra was infected on admission. These men spent 4,053 days in hospital, or an average of 33·5 days for each case. Major Crawford, R.A.M.C., had thirty-five consecutive cases which were treated by irrigation three times a day; the average time in hospital for these cases was seventeen days, and none of them had a relapse.

Several factors have an important bearing on the time required to effect a cure, viz. :—

(1) *The Situation of the Gonococci.*—If these are still on the surface, almost any drug will destroy them, even hot water in one case quoted to me; but when the gonococci have succeeded in penetrating the epithelial lining of the various ducts and follicles opening into the urethra they are perfectly protected from any attack, whether by internal medication or *via* the urethra.

(2) *The Man's own Resisting Powers.*—Anyone having had much to do with gonorrhœa must have remarked the very great differences which are shown by cases treated in the same way and under the same conditions. This can only be explained by the variable resistance possessed by different individuals to the gonococcus. When the germ has reached the drug-proof shelters afforded it under the epithelial lining of the accessory ducts, we are practically dependent on the man's own bactericidal power; if this fails to help us, the gonococci may lie quiescent for years.

(3) *The Test of Cure adopted by the Medical Officer.*—If easily satisfied that the man is cured, it is possible to greatly reduce the time in hospital; enquiry would show a high ratio of relapses, which could, of course, be called fresh infections for the purpose of statistics.

(4) *The Amount of Supervision exercised by the Medical Officer.*—Even the best of orderlies are liable to become slack and to carry out the treatment in a perfunctory manner if the medical officer does not frequently superintend the treatment himself.

(5) *Climate.*—In a hot, debilitating climate, like that of Malta in the summer, men quickly become "hospitalised" and the disease assumes the subacute form, being barely, if at all, influ-

enced by any form of treatment. In these cases, a change to our hill station, Imtarfa, where there is an excellent modern hospital and the men can be allowed outdoor exercise, has been found to exert a most beneficial influence.

(6) *Treatment*.—I have put this last as the least important influence. In the condition in which the soldier usually reports sick with gonorrhœa, viz., with the whole urethra infected, I believe the form of treatment to be of quite secondary importance. Irrigations will reduce the length of the acute stage by some or many days, but we are then confronted with the subacute and chronic stages, which, in many cases, may drag on till the surgeon almost despairs of ever getting rid of the patient. Both Lieutenant-Colonel Gerrard and I have tried the soothing treatment advocated in the Journal by Major French. Our opinions are in agreement that the acute stage lasted much longer than when irrigations were employed, while the subacute and chronic stages were the same in both cases.

*Relapses*.—The percentage of relapses after any form of treatment is obviously the best test of its efficiency, much more so than the time spent in hospital. It is frequently very difficult to determine whether a subsequent admission is due to a fresh infection or to a recrudescence of the original attack; even when the man owns to having exposed himself to the risk of infection since leaving hospital, this may merely have acted as an exciting agent, and stirred up a latent focus to fresh activity. I have endeavoured to note all genuine relapses in the figures given below, but it is quite possible that some real relapses may have escaped being recorded, as the men are not always admitted to the same hospital. In 734 case sheets, which were specially watched for relapses, only thirty-four were recorded, which gives a percentage of 4·6; this, if maintained in a larger series of cases, would I think show that the standard of cure adopted is fairly reliable.

*Condition on Admission*.—From general impressions, I should have said that it was exceptional to find a man admitted with the infection limited to the anterior urethra. I find, however, that in 496 sheets in which the condition on admission is noted, seventy-two men were admitted with an anterior urethritis only; this is equal to 14·5 per cent., which agrees nearly with Taylor's figures. Captain Meredith, R.A.M.C., had twenty-one of these cases, in nine of which the posterior urethra became infected subsequent to admission.

*Number of Times admitted with Gonorrhœa*.—This was

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originally recorded with the idea of only taking first attacks of the disease when working out the time spent in hospital; it was soon apparent that there was no constant difference in the length of time required to cure a first, second, or third attack, and that, if anything, the subsequent attacks seemed to be more quickly got rid of than the first one. The number of sheets in which this was recorded was 827. Of these:—

512 men	=	62	per cent. (nearly)	were	admitted	for	the	first	attack.
224	„	=	27	„	„	„	„	„	second „
60	„	=	7·2	„	„	„	„	„	third „
31	„	=	3·7	„	„	„	„	„	more than three times.

Many of the later admissions took place years after the first one; a few are relapses.

*Epididymitis*.—It has been stated that irrigations, especially in the acute stage, are liable to produce a variety of complications, chief of which is epididymitis; notes were therefore made on the sheets as to the occurrence of epididymitis on admission or during treatment.

Of 896 recorded cases 74, or 8·3 per cent. (nearly), were admitted with this complication, while 43, or 4·8 per cent., developed epididymitis while being treated by irrigations.

*Other Complications*.—In 812 sheets the following complications have been noted:—

Hæmaturia, 11 times = 1·35 per cent. This is rarely severe, it usually lasts from three to ten days. The only treatment adopted was to stop the irrigations and put the men to bed with a milk diet, urotropin being continued by the mouth. As soon as the urine cleared up irrigations were resumed.

Arthritis occurred 15 times = 1·7 per cent. Most of the cases in this series happened to be of a mild type.

Gonorrhœal ophthalmia was noted in three cases; two of the men recovered perfect vision, one man whose eye had been infected for thirty-six hours before admission recovered vision sufficiently to distinguish large objects but not to read.

Œdema of the penis occurred four times; this comes on rapidly after an irrigation and looks very alarming. If left alone it disappears in about twelve hours and the irrigations can then be resumed.

Penile abscess, the pus containing gonococci, was noted eight times; about half of these were admitted with the abscess in progress of formation; under ordinary surgical treatment these healed up rapidly and left no permanent trouble.

Prostatic abscess occurred once.

Incontinence: One man was admitted for incontinence of urine; on examination an acute gonorrhœa was found.

Retention: Two men were admitted with retention of urine, both had been drinking heavily immediately before admission. Examination revealed acute gonorrhœa in both cases.

Pyelitis: One man who had treated himself out of hospital for a month before reporting sick developed a very severe cystitis with later on symptoms of pyelitis. He was treated with rest in bed, urotropin and alkalies and milk diet. Under this treatment he recovered sufficiently to be sent to England on trooping duty; on his return some two months later all signs of the disease had cleared up.

*Penile Discharge.*—It commonly happens that a penile discharge containing gonococci reappears while the man is still undergoing treatment, and in spite of the discharge the urine may remain clear. The discharge probably comes from some follicle near the meatus, but it is not easy to locate it even with the aid of the endoscope. The most common times for the reappearance of the discharge are about the fifteenth and thirtieth days of treatment.

*Gonococci Vaccine.*—Two varieties of vaccine have been tried; one made in St. Mary's Hospital and the other by Burroughs Wellcome and Co. The dose of the first one is given as 5 million, and of the second 250 million for the first dose and 500 million for the second or subsequent doses. Up to the present fourteen cases have been treated by the first and thirteen by the second vaccine. The results seem to be much the same with either. There has been no local reaction, a great advantage, and consequently the soldier does not object to the use of the vaccine.

Without going into details of the cases our experience has been that in the chronic cases of gonorrhœa in which the infection is limited to the urethra no benefit has resulted from the use of the vaccine. This is specially disappointing, as it was hoped that these troublesome cases would be cured by this means. On the other hand, in every case which developed pyrexia there was a variable rise of temperature within a few hours of the first injection, followed by a rapid improvement; the temperature falling to normal in thirty-six to forty-eight hours. The improvement was most noticeable in cases of painful arthritis, the pain disappearing as the temperature fell and the swelling soon after; the pain of epididymitis was also quickly relieved. One case of severe arthritis of the knee-joint only derived a moderate benefit from the inocula-



tion, but the supply of vaccine failed just when he should have had a second injection, and by the time a fresh supply was received from England the joint symptoms pointed to erosion of the cartilage; the next inoculation had very little effect on his condition and he was invalided home. In these cases the urine quickly reached the chronic condition but did not further improve.

I presume that we may interpret the presence of pyrexia as being due to the fact that the gonococci have gained entrance to the general circulation, and by this path to wherever the secondary focus happens to be; they are consequently exposed to the action of any antibodies formed as the result of the inoculation and circulating in the blood, hence the benefit produced by the vaccine. In chronic gonorrhœa limited to the urethra the gonococci lie between the epithelial cells, or between these and the non-vascular basement membrane which protects the gonococci from the action of any antibodies in the general circulation.

The introduction of the vaccine has given us a powerful remedy for the treatment of gonorrhœal arthritis, and if only used at once we need no longer dread those prolonged cases of multiple arthritis which used to lie for weeks without any apparent improvement.

*Conclusion.*—In spite of the recent progress the treatment of gonorrhœa which has infected the whole urethra, *i.e.*, in the condition in which the soldier usually presents himself, is still most unsatisfactory. Bed and barley water flushing, gentle injections or copious irrigations may and do in many cases produce a rapid improvement, and by selecting cases it is possible to present a series of brilliant results by any method of treatment; I cannot help thinking, however, that in these cases it is to the man's own resisting powers rather than to the particular form of treatment employed that the credit is due. Bacteriologists may succeed in finding some other germ which if introduced into the urethra will turn out the gonococcus without producing a worse disease or damaging the urethral mucous membrane. Personally, I favour the irrigation plan, as I feel certain that no harm results from its use, and in cases treated by rest and internal medication, when the urine remains persistently turbid a few irrigations will often make it clear although not free from mucus and threads. The only hope of real improvement lies in getting rid of the gonococcus before it has had time to penetrate the epithelial lining of the urethra and its accessory ducts. To accomplish this we must get hold of our patients as soon after infection as possible, long before the man has any idea as to whether he has contracted the disease

or not, or, in other words, the diagnosis must be made by the medical officer with the aid of a microscope, and not left to the soldier to decide as at present. Every man who has exposed himself to the risk of contracting gonorrhœa must be made to report himself for examination on the second and third morning after the exposure. A trained orderly can easily prepare stained slides of the penile mucus, and the medical officer can then rapidly examine these microscopically. The extra work involved by this procedure would be much less than that entailed by having every gonorrhœa patient some six weeks in hospital. The examination could be made after the morning parade, so as not to interfere unduly with the performance of duty.

For assistance in preparing these notes I am much indebted to Royal Army Medical Corps officers in Malta, especially Lieutenant-Colonel Gerrard, Major Crawford, Captains Bransbury, Meredith and Maughan.

#### SPECIMEN GONORRHOEAL CASE SHEET USED IN MALTA.

Corps Name	Date of Admission	Discharge
Condition on Admission	Days in Hospital	Infected
No. of Admission	Complication	

Date	1st Urine	2nd Urine	Treatment	Remarks.

## SPINAL ANALGESIA IN SIERRA LEONE.

BY CAPTAIN J. W. H. HOUGHTON.

*Royal Army Medical Corps.*

As a sequel to a report on "Spinal Analgesia in Sierra Leone," published in the Journal for August, 1908, a further series of cases operated on in Freetown by the same method and under similar conditions is now presented.

In the previous series of eighteen consecutive cases, the substance used for the production of spinal analgesia was stovaine. In the second series of thirty-four consecutive cases here recorded the substance used for intra-spinal injection was tropococaine. It was thus hoped to compare these substances when used under similar circumstances, and, if possible, to determine whether any differences in action follow on their injection into the dural sac. The only method available for this comparison was clinical observation, which, though necessarily imperfect, would, when carried out in all cases by the same individual, tend to a uniformity of record.

The technique employed for the injection of tropococaine into the spinal canal in this second series of cases was similar to that described for the injection of stovaine, a 5 per cent. solution of tropococaine in distilled water being used. This solution has a higher specific gravity than cerebrospinal fluid, therefore the addition of sodium chloride or glucose, as in the use of stovaine, was unnecessary. Cerebrospinal fluid has a specific gravity of 1.007 and a 5 per cent. solution of tropococaine in distilled water has a specific gravity of 1.0106. Thus with a 5 per cent. solution of tropococaine it was possible to regulate the height of the analgesia with comparative accuracy by raising the patient's pelvis after injection, when the heavier analgesic fluid would sink to the lowest part of the spinal canal.

In two cases (Nos. 20 and 21) the tropococaine injection was delayed in action. This was due to the accidental presence of a slight trace of acid in the test-tube in which the solution was boiled prior to injection, and emphasises the necessity for the utmost care in the preparation of the solution for injection into the spinal canal.

In comparing the action of stovaine and tropococaine, observation was specially directed to determine:—

- (1) The completeness of the analgesia.

(2) The time elapsing between injection and the development of complete analgesia.

(3) The duration of the analgesia.

(4) The condition of the patient during the operation.

(5) The presence or absence of after-effects.

The analgesia in all cases appeared to be absolute while the injection fluid was in action.

In one case in each series, however, the analgesia passed off before the operation was quite finished. The operations were an hysterectomy and a removal of an elephantiasis scroti. Both were tedious operations and required two hours for their completion, which was effected under chloroform anæsthesia.

The time elapsing between injection and the development of analgesia was much the same with both stovaine and tropococaine. Analgesia was usually complete in from two to five minutes, and invariably the first region to be affected was the perineum. The duration of the analgesia was almost entirely dependent on the amount of the drug injected. Five centigrammes of stovaine, or 5 centigrammes of tropococaine, were found to produce an analgesia lasting about one hour. With 6 centigrammes of either drug this effect was prolonged to over ninety minutes. In none of the fifty-two cases injected did the condition of the patients during operation give the least cause for anxiety.

In two cases injected with stovaine the patients vomited during the operation. In both these cases the analgesia extended well above the umbilicus. In none of the cases injected with tropococaine was there vomiting, either during the operation or afterwards. But in the large majority of cases operated on analgesia was not necessary—and therefore not produced—at a higher level than the umbilicus. The after-effects in all cases were slight and confined to one symptom, namely, headache. This was complained of in four cases among the eighteen injected with stovaine, while of the thirty-four cases injected with tropococaine twelve complained of headache. When present the headache usually came on about two hours after sensation returned and generally lasted for two or three hours. It was easily controlled by phenacetin or morphia, and in no case did it recur after the patient had had a sleep.

The remaining thirty-six cases complained of no after-effects.

From these observations it is evident that the effects following the injection of stovaine or tropococaine into the spinal canal are very similar. The completeness of the analgesia pro-

Date, sex, and age	Rank, if any, and name	Operation for	Position of patient during injection. Puncture easy or not	Site of puncture and amount of spinal fluid withdrawn	Solution and amount injected	Position of patient after puncture. Pelvis raised or not	Time from puncture to : (1) Analgesia, (2) Beginning of operation, (3) End of operation	Maximum height of analgesia	Condition of patient during operation	Duration of analgesia, and after-effects in ward
(1) 1.9.08 F., 30	Mammy I., P.C. Hosp.	Plastic operation on vulva	Lying left side; easy	2nd lumbar space, good flow, 2 cc.	5 cgrms. tropo-cocaine	Laid on back. Pelvis raised 1 inch for 4 minutes	(1) 6 mins. (2) 8 " (3) 50 "	Umbilicus..	Excellent ..	90 mins. Headache the same evening; no vomit. Operator, Dr. Mayhew.
(2) 2.9.08 M., 20	Pte. McD., 1st W.I.R.	Hydrocele of cord (left)	Lying left side; easy	2nd space, good flow, 1 cc.	5 cgrms. tropo-cocaine	Laid on back. Pelvis raised $\frac{3}{4}$ inch for 6 minutes	(1) 6 " (2) 10 " (3) 25 "	1 inch below umbilicus	Good; a nervous subject	90 mins. No vomit. Had attack of malaria the same evening. Operator, Capt. Powell.
(3) 4.9.08 M., 22	Pte. A., W.A.R.	Hernia, right inguinal	Lying right side; easy	2nd space, slow flow, 1 cc.	5 $\frac{1}{2}$ cgrms. tropo-cocaine	Laid on back. Pelvis raised 3 inches for 8 minutes	(1) 8 " (2) 10 " (3) 40 "	4th costal cartilage	Excellent, though frightened before injection	80 mins. No headache no vomit. Operator, Capt. Packer.
(4) 4.9.08 M., 20	Pte. B., W.A.R.	Inflammation of inguinal glands (left)	Lying left side; easy	3rd space, good flow, 3 cc.	4 $\frac{1}{2}$ cgrms. tropo-cocaine	Laid on back. Pelvis elevated 2 inches for 8 minutes	(1) 8 " (2) 10 " (3) 20 "	Umbilicus..	Excellent ..	40 mins. Slight headache the same evening; no vomit. Operator, Capt. Packer.
(5) 7.9.08 M., 21	Pte. R., W.I.R.	Circumcision	Lying right side; easy	2nd space, good flow, 2 cc.	5 cgrms. tropo-cocaine	Laid on back. Pelvis raised 1 inch for 2 minutes	(1) 2 " (2) 5 " (3) 10 "	" "	" "	70 mins. Slight headache; no vomit. Operator, Capt. Powell.
(6) 26.9.08 M., 26	Pte. B., W.A.R.	"	Lying left side; easy	2nd space, good flow, 2 cc.	5 cgrms. tropo-cocaine	Laid on back. Pelvis raised 1 inch for 1 minute	(1) 2 " (2) 3 " (3) 8 "	" "	" "	60 mins. No headache; no vomit. Operator, Capt. Packer.
(7) 26.9.08 M., 19	Pte. S., W.A.R.	"	Lying left side; easy	2nd space, rapid flow, 10 cc.	5 cgrms. tropo-cocaine	Laid on back. Pelvis raised 1 inch for 1 minute	(1) 2 " (2) 3 " (3) 8 "	1 inch below umbilicus	" "	55 mins. No headache; no vomit. Operator, Capt. Packer.
(8) 29.9.08 M., 30	Native S., Col. Hosp.	Hernia, right inguinal	Lying right side; 2nd punc. easy	2nd space, slow flow, 3 cc.	5 $\frac{1}{2}$ cgrms. tropo-cocaine	Laid on back. Pelvis raised 3 inches for 3 minutes	(1) 4 " (2) 8 " (3) 40 "	Nipple line	" "	105 mins. No headache; no vomit. Operator, Dr. Renner.
(9) 1.10.08 M., 25	Native J., Col. Hosp.	Amputation left lower leg	Lying left side; 2nd punc. easy	2nd space, slow flow, 3 cc.	5 cgrms. tropo-cocaine	Laid on back. Pelvis raised 1 inch for 2 minutes	(1) 4 " (2) 8 " (3) 35 "	Umbilicus..	" "	60 mins. No headache; no vomit. Operator, Dr. Burrows.
(10) 6.10.08 M., 25	Gunner A., S.L.R.A.	Abscess thigh	Lying left side; 2nd punc. easy	2nd space, very small flow, $\frac{3}{4}$ cc.	5 cgrms. tropo-cocaine	Laid on back. Pelvis raised 2 inches for 3 minutes	(1) 3 " (2) 8 " (3) 25 "	Poupart's ligament	" "	60 mins. No headache; no vomit. Operator, Capt. Packer.
(11) 6.10.08 M., 24	Pte. M., W.A.R.	Circumcision	Lying left side; easy	2nd space, good flow, 5 cc.	5 cgrms. tropo-cocaine	Laid on back. Pelvis raised 2 inches for 1 minute	(1) 2 " (2) 8 " (3) 15 "	Umbilicus..	" "	55 mins. No headache; no vomit. Operator, Capt. Packer.

(12) 6.10.08 M., 23	Pte. M., W.A.R.	Circumcision	Lying left side; easy	3rd slow 2 cc.	5 cgms. tropo- cocaine	Laid on back. Pelvis raised 2 inches for 1 minute	(1) 2 mins. (2) 8 "	Umbilicus..	Excellent	60 mins. No headache; no vomit. Capt. Packer.
(13) 6.10.08 M., 23	Pte. B. S., W.A.R.	Removal in- guinal glands (left)	Lying left side; easy	3rd rapid 5 cc.	5 cgms. tropo- cocaine	Laid on back. Pelvis raised for 2 mins.	(1) 2 " (3) 5 "	"	"	65 mins. No headache; no vomit. Capt. Packer.
(14) 13.10.08 F., 40	Mammy T., P.C. Hosp.	Hysterectomy	Lying left side; easy	3rd good 2 cc.	6 cgms. tropo- cocaine	Laid on back. Pelvis raised 2 inches for 3 minutes	(1) 3 " (3) 15 "	1 inch above umbilicus	"	90 mins. No headache; no vomit. Operator, Dr. Mayhew.
(15) 13.10.08 F., 33	Mammy T., P.C. Hosp.	Examination of uterus	Lying left side; easy	3rd good 2 cc.	5 cgms. tropo- cocaine	Laid on back. Pelvis raised 2 inches for 2 minutes	(1) 2 " (3) 75 "	Umbilicus..	"	60 mins. No headache; no vomit. Operator, Dr. Mayhew.
(16) 13.10.08 M., 26	J. C., Col. Hosp.	Hernia, right inguinal	Lying right side; easy	2nd good 2 cc.	5½ cgms. tropo- cocaine	Laid on back. Pelvis raised 3 inches for 3 minutes	(1) 3 " (3) 30 "	Xiphister- num	"	90 mins. No headache; no vomit. Operator, Dr. Renner.
(17) 23.10.08 F., 30	Mammy C., P.C. Hosp.	Uterine dis- placement	Lying left side; easy	3rd rapid 10 cc.	5 cgms. tropo- cocaine	Laid on back. Pelvis raised 1 inch for 2 minutes	(1) 2 " (3) 8 "	Umbilicus..	"	60 mins. No headache; no vomit. Operator, Dr. Mayhew.
(18) 5.11.08 M., 17	Boy H., W.I.R.	Circumcision	Lying left side; easy	3rd slow 2 cc.	5 cgms. tropo- cocaine	Laid on back. Pelvis raised 2 inches for 2 minutes	(1) 2 " (2) 5 " (3) 10 "	"	"	70 mins. Slight headache the same evening. No vomit. Operator, Capt. Houghton.
(19) 5.11.08 M., 28	Pte. D., W.I.R.	"	Lying left side; easy	3rd slow 2 cc.	5 cgms. tropo- cocaine	Laid on back. Pelvis raised 2 inches for 1 minute	(1) 1 " (2) 5 " (3) 10 "	"	"	60 mins. No headache; no vomit. Operator, Capt. Houghton.
(20) 18.11.08 M., 25	L.-Cpl. H., W.I.R.	"	Lying right side; easy	3rd slow 2 cc.	5 cgms. tropo- cocaine	Laid on back. Pelvis raised 2 inches for 10 minutes	(1) 10 " (2) 12 " (3) 20 "	Poupart's ligament	"	35 mins. Headache; no vomit. Solution of tro- pococaine not satisfac- tory. Operator, Capt. Houghton.
(21) 18.11.08 M., 30	L.-Cpl. H., W.I.R.	Opening in- guinal glands, right side, and circum- cision	Lying right side; easy	3rd slow 2 cc.	5 cgms. tropo- cocaine	Laid on back. Pelvis raised 3 inches for 10 minutes	(1) 10 " (2) 12 " (3) 20 "	Iliac crests	"	35 mins. Headache; no vomit. Solution of tro- pococaine not satisfac- tory. Operator, Capt. Houghton.
(22) 19.11.08 M., 46	M., Col. Hosp.	Elephantiasis scroti (15 lb.)	Lying left side; easy	3rd good 2 cc.	5½ cgms. tropo- cocaine	Laid on back. Pelvis raised 2 inches for 2 minutes	(1) 2 " (2) 10 " (3) 60 "	Umbilicus..	"	80 mins. No headache; no vomit. Operator, Dr. Burrows.
(23) 24.11.08 M., 30	S., Col. Hosp.	Elephantiasis scroti (40 lb.)	Lying left side; easy	3rd good 2 cc.	5½ cgms. tropo- cocaine	Laid on back. Pelvis raised 2 inches for 3 minutes	(1) 3 " (2) 15 " (3) 120 "	"	Excellent for 100 mins. No headache; no vomit. A lengthy operation taking 2 hours to complete. Operator, Dr. McConachy.	

Date, sex, and age	Rank and name	Operation for	Position of patient during injection. Puncture easy or not	Site of puncture and amount of spinal fluid withdrawn	Solution and amount injected	Position of patient after puncture. Pelvis raised or not	Time from puncture to : (1) analgesia. (2) Beginning of operation. (3) End of operation	Maximum height of analgesia	Condition of patient during operation	Duration of analgesia, and after-effects in ward
(24) 15.12.08 M., 26	Gunner B., R.G.A.	Circumcision	Lying right side; easy	3rd space, rapid flow, 5 cc.	5 cgms. tropo-cocaine	Laid on back. Pelvis raised 2 inches for 5 minutes	(1) 5 mins. (2) 10 " (3) 18 "	Xiphisternum	Excellent	60 mins. Slight headache; no vomit. Operator, Capt. Weston.
(25) 27.12.08 F., 16	Native C., P.C. Hosp.	Ovariectomy, right side	Lying left side; easy	2nd space, good flow, 2 cc.	6 cgms. tropo-cocaine	Laid on back. Pelvis raised 3 inches for 3 minutes	(1) 3 " (2) 10 " (3) 40 "	Xiphisternum	"	85 mins. No headache; no vomit. Operator, Capt. Houghton.
(26) 27.12.08 F., 38	Native K., P.C. Hosp.	Perineal fistula	Lying left side; easy	3rd space, good flow, 2 cc.	5 cgms. tropo-cocaine	Laid on back. Pelvis raised 2 inches for 2 minutes	(1) 2 " (2) 8 " (3) 25 "	Umbilicus	"	70 mins. No headache; no vomit. Operator, Dr. Mayhew.
(27) 27.1.09 M., 30	Gunner M., R.G.A.	Removal inguinal glands (left)	Lying left side; easy	3rd space, good flow, 2 cc.	5 cgms. tropo-cocaine	Laid on back. Pelvis raised 2 inches	(1) 3 " (2) 10 " (3) 25 "	"	"	65 mins. Slight headache same evening. No vomit. Operator, Capt. Weston.
(28) 27.1.09 M., 22	Gunner B., R.G.A.	Circumcision	Lying left side; easy	3rd space, good flow, 2 cc.	5 cgms. tropo-cocaine	Laid on back. Pelvis raised 2 inches	(1) 3 " (2) 10 " (3) 25 "	"	"	60 mins. No headache; no vomit. Operator, Capt. Weston.
(29) 11.2.09 F., 36	Mammy G., P.C. Hosp.	Uterine tumour	Lying left side; easy	2nd space, good flow, 1 cc.	6 cgms. tropo-cocaine	Laid on back. Pelvis raised 2 inches for 4 minutes	(1) 4 " (2) 10 " (3) 40 "	Xiphisternum	"	80 mins. Slight headache; no vomit. Operator, Dr. Mayhew.
(30) 3.2.09 M., 26	Pte. L., 2nd W.I.R.	Circumcision	Lying left side; easy	3rd space, good flow, 1 cc.	5 cgms. tropo-cocaine	Laid on back. Pelvis raised 2 inches for 2 minutes	(1) 2 " (2) 5 " (3) 15 "	Iliac crests	"	60 mins. Slight headache; no vomit. Operator, Capt. Langstaff.
(31) 3.2.09 M., 27	Pte. J., 2nd W.I.R.	"	Lying left side; easy	3rd space, good flow, 1 cc.	5 cgms. tropo-cocaine	Laid on back. Pelvis raised 2 inches for 2 minutes	(1) 2 " (2) 6 " (3) 20 "	"	"	60 mins. Slight headache; no vomit. Operator, Capt. Langstaff.
(32) 3.2.09 M., 30	Pte. G., 2nd W.I.R.	"	Lying right side; 2nd punc. easy	2nd space, good flow, 2 cc.	4 cgms. tropo-cocaine	Laid on back. Pelvis raised 2 inches for 2 minutes	(1) 2 " (2) 10 " (3) 20 "	Umbilicus	"	40 mins. No headache; no vomit. Operator, Capt. Langstaff.
(33) 5.2.09 M., 56	Native J., Col. Hosp.	Elephantiasis, scroti (38 lb.)	Lying left side; easy	2nd space, good flow, 1 cc.	6 cgms. tropo-cocaine	Laid on back. Pelvis raised 2 inches for 2 minutes	(1) 2 " (2) 10 " (3) 80 "	"	"	90 mins. No headache; no vomit. Operator, Capt. Houghton.
(34) 9.2.09 M., 60	Native G., Col. Hosp.	Elephantiasis, scroti (50 lb.)	Lying left side; easy	2nd space, slow flow, 1 cc.	5 1/2 cgms. tropo-cocaine	Laid on back. Pelvis raised 2 inches for 2 minutes	(1) 2 " (2) 10 " (3) 65 "	"	"	75 mins. No headache; no vomit. Operator, Dr. Burrows.

duced, and its time of occurrence and duration were practically the same with either drug; perhaps headache was a less frequent after-effect of injection with stovaine. But the number of cases here recorded is far too small to form a basis for any generalisation as to the comparative merits of these different substances when injected into the spinal canal.

In no case did either drug fail in its specific action after injection into the dural sac. In the later series there was no failure to reach the sac, although difficulties were experienced in one or two cases.

Of the thirty-four cases in which tropococaine was employed, thirty-one were natives of Sierra Leone, of ages ranging from 16 years to 60.

The female patients were all operated on in the Princess Christian Hospital, where Dr. Mayhew kindly allowed me to assist him. I am also indebted to Dr. Burrows and Dr. Renner, of the Colonial Hospital, for several interesting cases, and to the various officers of the Royal Army Medical Corps, who so kindly arranged for the majority of the operations.

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## FURTHER NOTES ON FEVERS IN MALTA.

BY LIEUTENANT-COLONEL J. J. GERRARD, M.B.  
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IN my last paper I was able to show that in Malta pyrexia of uncertain origin embraces three forms: three-day, seven-day, and ten-day fevers.

It seemed to me that it would be of interest to enquire into the relative frequency of their occurrence, and with this end in view I have attempted an analysis of the 726 cases which occurred in this district during the past five years, 1904-1908.

The incidence in the different years was as follows:—

TABLE I.—SHOWING THE CASES OF SIMPLE CONTINUED FEVER AND PYREXIA OF UNCERTAIN ORIGIN WHICH OCCURRED IN THE PEMBROKE DISTRICT, MALTA, DURING THE FIVE YEARS 1904-1908.

		Strength	Admissions	Detained	Total cases	RATIO PER CENT.	
						Admissions	Total cases
1904	..	1,784	133	?	133	7·5	7·5
1905	..	1,718	150	?	150	8·7	8·7
1906	..	2,044	175	?	175	8·5	8·5
1907	..	1,876	89	56	145	4·7	7·7
1908	..	1,494	61	72	123	3·4	8·2

This table is interesting as showing that though there has been a distinct fall in the admission-rate, the actual incidence of the fevers is about the same, and that the addition of the "detained" cases brings the ratios per cent. into keeping in rather a curious way.

Unfortunately, I have no records of the cases of fever detained in former years. No doubt there were some, but judging by the analogy of 1906, when I first took over charge of this hospital, I think that perhaps there were not many. We were all very much in dread of Mediterranean fever in those days, and any man coming sick with his temperature raised was "suspect" and was taken into hospital under observation (my own rule was to "admit" any man with a temperature of 100° F. or over). Of course this kept up the admission-rate, but I think it was a very wise precaution. Still, some cases are bound to have been detained, and the incidence of the fever has no doubt diminished. This is what one would expect, as the disappearance of Mediterranean fever should be and

has been followed by the disappearance of those atypical cases which undoubtedly did occur, and which for want of a better name were returned as simple continued fever. Such atypical cases occur in every epidemic, and disappear coincidentally with it. But the true simple continued fever cases, if I may call them so, the three-day, seven-day, and ten-day fevers, are quite separate diseases from Mediterranean fever, and are not affected by its disappearance. Their admission-rate is affected by it, as we have just seen, as being no longer in dread of the more serious disease I was able to alter my rule and for the past two years I have "detained" every man coming sick with fever. The result has been that in 1907, 38 per cent., and in 1908, 58 per cent. of these detained cases were found to have a normal or subnormal temperature next morning. They were consequently able to be treated in barracks, being excused duty and attending at the inspection room three times a day for whatever treatment and observation was considered necessary.

*Time in Hospital.*—It is not necessary to go into this, as McCulloch and Weir, from an analysis of 4,311 cases (Mediterranean Fever Committee Report, vol. vii.), showed that 75 per cent. of the cases did not require more than ten days in hospital.

*Seasonal Prevalence of the Fevers in General.*—This has also been exhaustively studied by the same authors and does not require any further remark.

The point which has first to be determined in any attempt at classifying these cases of fever, is the duration and character of the fever. I have consequently made out the following table, which groups the cases according to the number of days on which they actually suffered from "fever"; a temperature of 99° F. or over being taken as the standard of "fever." The table has been made out by taking the names in the admission and discharge books, and finding out what their temperatures had been in the temperature books—these are books in use in this and other hospitals, in which the temperatures of all patients suffering from fever, from any cause, are entered up morning and evening; they are in addition to the ward records.

In making out the following table I have had to deduct ninety-six cases from the original total, viz., forty-nine which were transferred to other hospitals; forty-seven which cannot be satisfactorily traced—in some cases owing to the names being omitted, in others to loss or damage of particular pages, in others, again, to there being no record of any temperature over 99° F. This leaves a total of 630 cases which suffered from fever as follows:—

TABLE II.—SHOWING THE NUMBER OF DAYS ON WHICH THE CASES ACTUALLY SUFFERED FROM FEVER (99° F. AND OVER).

	DAYS												Total
	1	2	3	4	5	6	7	8	9	10	11	12 and over	
1904 ..	33	36	21	16	10	3	2	—	1	1	2	—	125
1905 ..	26	40	30	16	12	7	2	1	3	2	—	4	143
1906 ..	80	39	11	7	1	1	—	3	—	—	—	1	143
1907 ..	66	13	13	13	6	5	3	—	—	—	—	—	119
1908 ..	73	7	5	8	3	1	3	—	—	—	—	—	100
Total..	278	135	80	60	32	17	10	4	4	3	2	5	630

The principal point brought out by this table is the short duration of the fever in the majority of cases; 278 of the cases, or 38 per cent. of the original total, had fever in hospital for only one day; and 493, or 68 per cent., for not more than three days. These figures are obviously below the mark on account of the ninety-six cases which have been deducted above. If we consider, first of all, the cases having fever for only one day in hospital, it will be noticed that they have increased markedly in the last three years. On the other hand, the numbers of those having fever for two or three days have equally markedly decreased during that time; while during 1904 and 1905, it was just the other way about. This was not due to any marked alteration in the incidence of this class of fevers, as is shown in the following table :—

TABLE III.—SHOWING THE VARIATION IN THE NUMBER OF CASES HAVING FEVER FOR ONE, TWO, OR THREE DAYS.

	Strength	NUMBER OF CASES WHICH HAD FEVER FOR—			Total	Percentage of strength
		1 day	2 days	3 days		
1904 ..	1,784	33	36	21	90	5·10
1905 ..	1,718	26	40	30	96	5·58
1906 ..	2,044	80	39	11	130	6·36
1907 ..	1,876	66	13	13	92	4·90
1908 ..	1,494	73	17	5	85	5·68

The question then arises—what was this transference of cases from one category to another due to? The simplest explanation seems to be that in former years, when Mediterranean fever was rife, the men came to hospital earlier in the attack, no doubt on account of their dread of the disease, while now that it has disappeared they are more inclined to wait, and to lie up in their

barrack-rooms, hoping that the attack will pass off. In practice this was brought home to me by the fact that in my first year here—1906—I used to have many cases of three-day fever in their first or second day; for the past two years this has not been so. At first sight this explanation does not appear to fit in with the figures for 1906 when Mediterranean fever had not been quite got rid of, but it must be remembered that in the first place the disease was nipped in the bud that year and never became really ripe, and secondly that the majority of the simple continued fever cases were from a battalion which had lately come to the Island, and the men had not had any experience of the disease in epidemic form.

This fact of the tendency for the majority of cases to have fever for only one day in hospital is of importance from an administrative point of view, as it is evident that, speaking broadly, such cases do not require "admission" to hospital, and can be disposed of effectively by being "detained" for the day and afterwards treated in barracks. During the last two years my "detained" cases, that is, cases treated in this way, have averaged 47·7 per cent. of all cases of fever seen, and my admission-rate has fallen from an average of 8·2 per cent. for the first three years of this series to 4·05 per cent. for the last two. There were other factors at work as well, of course, in producing this last result, but the figures are certainly interesting, and I think the practice of "detaining" all cases for one day (on the legal principle of allowing every dog one bite) has had far and away most to do with it.

To return, however, to Table II.: another noticeable point is the disappearance of cases having fever for more than seven days in the last two years, and for more than eight days in the last three. This is partly due to the more severe cases being sent to other hospitals for treatment, and also to the disappearance of those long-continued indefinite cases which were most probably atypical cases of Mediterranean fever. Of the eighteen cases shown in the table as having had fever for eight days or over, thirteen are of this suspicious character, judging, that is, by the temperature charts; of the other five, two cases look like paratyphoids, and three are "ten-day" fevers.

Of the cases having fever for four days, the majority are "three-day" fevers, in which there was a slight rise of temperature—99° F. or so—on the fourth day. The others, and those in the five, six, and seven-day columns, are cases of seven or ten-day fevers, which came in at different stages of the disease.

I have next attempted to divide up these cases into the different classes of fevers they appear to have suffered from. I can make no claim, of course, to absolute accuracy; with nothing but the temperature records to go on in nearly all the cases, such a claim would be absurd. This classification gives my personal opinion of the fevers, judging from the temperature charts (which, however, I must say, were in most instances fairly typical).

TABLE IV.—CLASSIFICATION OF THE CASES INTO THE DIFFERENT CLASSES OF FEVERS

			Ephemeral cases	"3-day" fevers	"7-day" fevers	"10-day" fevers	Suspicious cases
1904	..	..	23	76	11	9	6
1905	..	...	26	80	16	8	13
1906	..	..	30	107	2	3	1
1907	..	..	25	80	8	6	—
1908	..	..	21	70	5	4	—

Taking first the "suspicious cases": I have already alluded to eleven of these, the other seven were cases which had fever for only a few days, but of a low, irregular character, and which were kept in hospital so long that one cannot help feeling that they were looked on with suspicion, though, of course, it is possible there was some other reason.

Taking the three-day fevers next, I found the separation of them from those which had fever for only one day a difficult task; without clinical notes and without seeing the patient, it was obviously not easy to make up one's mind. In 252 instances I was able to make a diagnosis with comparative certainty, as the temperature recorded showed a fever of two, three, and sometimes even part of a fourth, days' duration. But I was still left with 278 cases in which the records only showed fever for one day, and nothing else to go on. One knew from experience that many, indeed most of them, were three-day fevers, which only came to hospital on the third day, but the difficulty was to separate them from the other cases in which the fever had only lasted one day altogether. If I had been certain that all the cases of fever had come sick on the first day of their illness there would have been no difficulty, but I was very far from being certain; in fact, for the last two years I was certain they had not; and we have seen how the tendency is for the figures in the first column—one-day fever—to grow at the expense of the second and third since Mediterranean fever has disappeared. But we also saw that the contrary held good in 1904 and 1905, and in 1905 the number of

cases having fever for one day was the lowest of the series. Mediterranean fever in that year was at its worst, and occupied everyone's thoughts; cases constantly occurring, hospitals full, the disinfecting staff continually in barracks disinfecting rooms, and all the rest of it. So I think it is reasonable to suppose that when a man got fever he either reported sick, or was sent sick at once; and I do not think it is going too far to assume that in that year the cases which are shown as having had fever for only one day were really one-day fevers, and that any cases of three-day fevers which occurred were in hospital for two or three days of the attack. On these grounds I have taken the figures for 1905 as a standard, and have calculated the cases in other years by them. In this way there were twenty-six cases which had fever for only one day in 1905, that is, 17·33 per cent. of the total admissions. Consequently, I have taken 17 per cent. of the admissions in the other years and classified them as being of the ephemeral class. The balance of the cases which had fever for one day I have classed as three-day fevers, and have added them on to the other cases of that disease which I had previously diagnosed. That this method was substantially accurate appears from the following table, showing the incidence per hundred of strength for each year worked out from the numbers so obtained. The uniformity is, I think, remarkable. The increase in 1906 was probably due to the majority of the cases coming from a young battalion in its first summer in Malta. The decrease last year is very likely due to mild cases not coming to hospital at all.

TABLE V.—SHOWING THE INCIDENCE-RATE OF THE  
"3-DAY" FEVERS.

		Strength	Percentage of strength	Percentage of all cases of S.C.F.
1904	..	1,784	4·23	57·14
1905	..	1,718	4·65	53·33
1906	..	2,044	5·26	61·14
1907	..	1,876	4·26	55·10
1908	..	1,494	4·66	56·88

The slight ephemeral cases I have referred to are met with everywhere, and I think are well known. They occur during the hot weather, and comprise such cases as the man who falls out on a route march or on parade, the military policeman who has been on duty in the sun, or the man who is feeling weak and has to be relieved off guard, and so on. Sometimes they have taken

too much drink overnight, sometimes not. They all present much the same symptoms: temperature 99° to 101° F., pulse 90 to 100, skin moist, with slight perspiration, tongue moist and flabby, generally pale in colour, slight headache, and complain of feeling weak and faint. In the evening the temperature rises to 101° to 102° F., and is normal or subnormal in the morning. Such cases are generally described as "heat exhaustion," "a touch of the sun," or something of that sort. There appears to be some disturbance of the heat-regulating mechanism, due to the heat of the sun or of the air, in a man whose digestive arrangements are out of order or who is run down from any cause. One sees a certain number of these cases every year, and they should not be confused with the three-day fevers, from which they are quite distinct.

The following table shows the monthly incidence of these two forms of fever taken together:—

TABLE VI.—TABLE SHOWING THE MONTHLY INCIDENCE OF FEVERS OF THE "EPHEMERAL" AND "3-DAY" CLASSES TAKEN TOGETHER.

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1904	2	—	2	—	—	1	38	29	19	4	4	—
1905	—	2	2	2	1	33	26	20	15	4	1	—
1906	1	1	—	—	1	36	59	12	15	9	3	—
1907	2	4	1	5	10	12	28	17	13	5	5	3
1908	1	—	9	20	16	15	13	11	3	—	—	4

This table is in keeping with the charts given by McCulloch and Weir, and shows that, on the whole, the greatest incidence of the disease is the period June to September. Certain variations in different years are of interest, thus, in 1904 the epidemic began suddenly in July, in 1905 and 1906 equally suddenly in June. In 1907 the cases were much more evenly spread out, but the greatest number of cases occurred in July. Last year most cases were in April, and the worst period April to July, which is unusual.

*Seven-day Fevers.*—This class includes all the cases which showed the "saddle back" type of temperature chart described by Rogers in his Calcutta cases. I have been able to recognise forty-one instances, most of them in 1904 and 1905. The small number of cases in the last two years, 1907 and 1908, is accounted for, I think, by the fact that cases which appear likely to be at all severe are sent to other hospitals for treatment, but there being only two cases in 1906 is rather remarkable, particularly as that year was such a bad one for the three-day form of fever.

The monthly incidence of the cases was as follows:—

TABLE VII.—TABLE SHOWING THE MONTHLY INCIDENCE OF THE "7-DAY" FEVERS.

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1904	—	—	—	—	—	—	5	1	3	—	2	—
1905	—	—	1	—	1	6	2	2	4	—	—	—
1906	—	—	—	—	—	—	1	—	—	1	—	—
1907	—	—	1	1	—	1	2	1	—	—	1	1
1908	—	—	—	2	2	—	—	—	—	—	—	1
Total	—	—	2	3	3	7	10	4	7	1	3	2

This table would seem to show that the monthly incidence of the seven-day fevers corresponds with that of the milder forms. The months of greatest prevalence were June to September, 66 per cent. of the cases occurring during that period. Last year most cases were seen in April and May, which also corresponds with the three-day fevers whose incidence we have already noted as being irregular last year.

*Ten-day Fevers.*—The fevers of this type are more difficult to recognise from the temperature charts alone. I have only been able to satisfy myself as to thirty cases (4·5 per cent.). Many cases of this type of fever, also, would have been sent to other hospitals, and the few cases in 1906 are remarkable, coinciding, as they do, with the diminished incidence of seven-day fevers.

The following table shows the distribution of the cases:—

TABLE VIII.—TABLE SHOWING THE INCIDENCE OF THE "10-DAY" FEVERS.

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1904	2	—	2	1	—	—	—	—	1	—	—	3
1905	1	—	1	—	1	3	1	—	—	1	—	—
1906	—	—	—	—	1	—	—	—	2	—	—	—
1907	1	—	1	1	1	—	1	—	—	—	—	1
1908	—	—	—	1	—	1	—	—	—	—	—	2
Total	4	—	4	3	3	4	2	—	3	1	—	6

The incidence of this type of fever differs from both the three-day and seven-day forms in that most cases do not occur in the June to September period, only eleven cases of this series being met with in those months. There were more cases in December than in any other month.

I do not think, however, that any legitimate conclusions can be drawn from either of these last two tables; the numbers are so small and the distribution of the cases so irregular.



In conclusion, there are one or two points which I would like to mention; one is, that in describing the three-day fevers I omitted any reference to the "sore throat" of which these cases very often complain. There is little to be seen beyond a general pharyngeal congestion and some vesicles on the soft palate. These vesicles, I believe, have been described by Doerr in the cases which he saw in Herzegovina, and so I should like to bear testimony to their having been noticed and described in 1907 by Lieutenant (now Captain) P. J. Marett, of our Corps.

TABLE SHOWING THE INCIDENCE PER CENT. OF STRENGTH OF THE VARIOUS TYPES OF FEVER.

	1904	1905	1906	1907	1908
"Ephemeral" cases .. ..	1.28	1.51	1.41	1.33	1.40
3-day fever .. ..	4.23	4.65	5.26	4.26	4.66
7-day fever .. ..	0.61	0.93	0.09	0.42	0.33
10-day fever .. ..	0.50	0.46	0.14	0.31	0.27
"Suspicious" cases .. ..	0.44	0.75	0.04	—	—
Transfers, &c. .. ..	0.44	0.40	1.56	1.38	1.54
	7.50	8.70	8.50	7.70	8.20

SHOWING ADMISSIONS AMONG OFFICERS FOR SIMPLE CONTINUED FEVER AND PYREXIA OF UNCERTAIN ORIGIN.

	Strength	Admissions	Ratio per cent.
1904	35	10	28.5
1905	40	9	22.5
1906	48	18	37.9
1907	32	7	23.6
1908	23	5	21.7

SHOWING ADMISSIONS AMONG WOMEN FOR SIMPLE CONTINUED FEVER AND PYREXIA OF UNCERTAIN ORIGIN.

	Strength	Admissions	Ratio per cent.
1904	51	16	31.3
1905	68	3	4.4
1906	145	13	9
1907	98	9	9
1908	55	5	9

My only other point is to reiterate my belief as to the nature of these fevers. All their signs and symptoms point to their belonging to the "enteric" group, but to waive them aside as being merely "atypical enterics" seems to me to be only begging the

question. Paratyphoid fever is also an "atypical enteric" in which a particular modification of the enteric bacillus has been isolated. These other fevers differ as little or as much from paratyphoid and from one another as paratyphoid does from enteric, so that there is nothing inherently improbable in their causal organisms being still further modifications of that bacillus. No doubt all attempts at causing the *Bacillus coli* to develop into the *B. typhosus* have so far failed, but I cannot imagine any bacteriologist admitting that he had reached finality. I, of course, am only looking at the question from its clinical side, but to me these fevers seem to form an ascending scale of gradually increasing severity, culminating in enteric fever, and however heterodox the opinion may be, I believe that they represent stages in the development *de novo* of enteric fever.

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## A NOTE ON SOME WATER SUPPLIES IN SOMALILAND.

BY CAPTAIN D. S. SKELTON.

*Royal Army Medical Corps.*

THAT "the supply of wholesome water in sufficient quantity is a fundamental necessity" is an aphorism, more applicable to Europe in general than to Somaliland in particular, will be obvious to anyone familiar with conditions which obtain in the "Horn of Africa." There the "fundamental necessity" is to obtain a supply of water sufficient to support human life.

An examination of the table of chemical analyses of the water found in the more important stations in the country will give rise to surprise that the country is as healthy as it actually is. Generally speaking, without going so far as to say that the country is a health resort, it is almost extraordinary that British officials should be so free from those intestinal complaints which in other lands are invariably associated with a limited supply, little care as to the source, and, in many cases, grave animal and vegetable pollution of the water. Yet in spite of the fact that filtration is very seldom adopted by individuals, and never on a large scale by communities, enteric fever and cholera are practically non-existent, the last outbreak of cholera being in 1892, when it was an epidemic almost entirely confined to the Coast, at least as far as we know. There is also little evidence of the prevalence of dysentery. In the 1901 Expedition dysentery cases appear as 3·9 per cent. of the admissions to hospital, but the cases were mild and recovered in "two or three days" (!). In the campaign of 1901-04 some 300 to 400 cases of excessive purgation were treated daily. This is not the place to enter into a criticism of these figures, but dysentery cured in "two or three days" is not dysentery as it is understood in India and South Africa, and without bacteriological confirmation I would class them rather as cases of "excessive purgation" due to some other cause.

In spite of this freedom from disease the majority of well waters are really unsafe and should not be trusted. Even the most primitive people are careful not to foul their water supplies if possible, a trait which is only *just* apparent among the Somalis. But even the Somalis recognise that there does lie some hidden danger in shallow surface water, for it is noticeable that in drawing their water from, say, pools in a river bed, they prefer to dig a small,

shallow trench near the water hole, and so improvise a ready and very effective sand filter.

For a proper interpretation of the results of a water analysis, some idea of the general geological formation of the collecting area is essential. Excepting Burao, Oadweina, and Hargeissa, my results are concerned with waters derived from the Maritime Range, the foot-hills of the Golis, the Golis Range itself, and the Ain Valley.

In all these instances the fundamental rock is metamorphic, generally belonging to the second group, where the original sand and limestone can still be recognised. The latter in the Nogal and Ain Valleys attains a great depth, some 1,800 feet. In the hills enclosing these valleys the gypsum has a considerable influence on the physical characters of the water. It is unnecessary to enlarge here on the effects of the violent seismic action that at no very remote date, geologically speaking, convulsed this part of Africa, except to note that possibly its effects remain and are responsible for the high temperature and salinity of the water at Dubar, whence Berbera obtains its constant water supply.

At the same time it is interesting to observe from a scientific point of view the relation between the results of water analysis and the geology of the collecting area; and probably more elaborate tables than mine, especially of the various salts, would throw more light on some of the many problems that the geology of North-east Africa presents. The waters collected from deep wells at Burao, Oadweina, and Hargeissa can be put in a separate class as regards their geological origin. At these places the wells are said to tap underground rivers whose original and not very distant source would be from upland surfaces. These waters filter through the limestone, and, of course, acquire many of their qualities from that stratum.

It is regrettable that we are not in possession of more reliable data as to the actual rainfall in the country. Except at Berbera and at Sheikh no record is kept at all, and even in these places the exigencies of service apparently give rise to returns that are not rigidly exact. At Berbera in 1891 to 1892 the rainfall was 12 inches; 1892 to 1893 it was 1·21 inches; 1893 to 1894, 0·92 inches and so on, the average being about 3 inches. At Sheikh (4,500 feet) in 1904 the rainfall was returned at 11·3 inches, and in 1908, the returns of which I am responsible for, it was 24 inches. In the interior the rainy months last from April to September, the wettest month being apparently September. At Sheikh the wet months are April and May, with a small rise in the curve in August.

From these figures it will be seen that the country cannot rely to any great extent on the rainfall as a direct means of filling its water holes and tanks. I think it is desirable to mention these figures, if only because it is commonly supposed by those who have not been in Somaliland, that it is a dry, arid, and waterless desert, whereas in reality it is nothing of the kind.

A word is necessary in regard to the analytical tables I submit with these notes, and to the deductions as to the purity or otherwise of the various waters.

It will be remembered that the value of a chemical analysis alone is, unfortunately, small. But from a chemical analysis data are obtained that justify the assumption (1) that such and such a water is most probably a safe water, or (2) that it most certainly is a water unfit for domestic use, for the use of animals, or for trade purposes. It is agreed that if a chemical examination is to be relied on there should be local standards, so that if at any time there is found to be a deviation from that particular standard, then the means which are being relied on as safeguards have suddenly failed, and thus a warning is given that something is wrong.

Lieutenant-Colonel Firth points out that an opinion should be given on information derived (1) from an inspection for any possible pollution at the source; (2) from the results of a bacteriological examination made almost immediately after collection; and (3) from the results obtained by chemical analysis. The first and third examinations I have been able to carry out, and from these, at least, I am able to warn against a possible danger. The evidence of recent, or present, animal—and therefore dangerous—pollution is to be found (1) in a relatively high chlorine figure not explicable on geological grounds; (2) in a high figure for the free and saline ammonia; and (3) under normal circumstances, in a high figure for the oxydized nitrogen. I have used Thresh's travelling analysis box, and owing to not having the necessary reagents with me in my journeys from place to place, some of which were over a 100 miles from one another, I have not made an estimation of the albuminoid ammonia. I do not hold, however, that this necessarily vitiates the interpretations as far as I have gone, because the albuminoid ammonia figure is useful, not for telling how good a water is, but, like the "oxygen absorbed," for giving an idea of *how bad a water is*. Again, if the pollution is of remote date, we look to much oxydized nitrogen and little free ammonia. As a matter of fact, with the exception of the waters from Sheikh, Behindula, and Hargeissa, I have not analysed a single sample that could be

described as a normal water. The presence of reducing salts of iron, of sodium chloride by admixture with small amounts of sea water, as at Berbera, of hydrogen sulphide (as  $H_2S$ ), and of permanganate of potash (artificially introduced), all tend to produce a complex chemical action, which makes the results not quite straightforward to interpret. In these cases the value of a careful local inspection is of great importance.

In the estimation of the oxygen absorbed, I have used the test—fifteen minutes at  $200^\circ F$ . But in the case of the waters collected from the Ain Valley, one is face to face with the fact that they all contain iron salts or sulphuretted hydrogen, or both, either of which reduces permanganate of potash. Waters of this class I do not consider to be strictly normal, at all events for the purposes of analysis. They therefore require special consideration if the results are to be rightly interpreted from a chemical standpoint, as distinguished from a bacteriological examination.

Dealing with the individual water supplies:—

(1) *Berbera*.—Derives its supply from three springs at Dubar, some eight miles from the town, to which the water is conveyed in iron pipes. The supply is constant all the year round, and the yield appears to be sufficient for present needs. The temperature of the water at its source is  $104^\circ F$ ., showing that it comes from a great depth, which I estimate to be about 1,500 feet. The service is on the intermittent system. The water is collected from the springs by concrete channels and 6-inch iron pipes, and then carried into two settling tanks, passing from one to the other by gravity. The value of these tanks is shown by the analytical results made in 1899; while at the spring the free ammonia figure is 0.024, after passing through the tanks it becomes 0.004 parts per 100,000. The source and the tanks are surrounded by a stone wall, and the whole installation is looked after by regular custodians. In fact the precautions adopted leave nothing further to be desired.

A troublesome factor in the supply to the town, that may be mentioned here, lies in the deposit which forms in the iron pipes. In time this leads to their almost entire occlusion. A qualitative examination of this deposit has been made. The bulk of it is soluble in  $HCl$ ., and the remainder consists of calcium carbonate, with a little calcium sulphate and some iron.

In future, when new pipes are needed it might be found worth while to get expert advice as to the use of iron pipes that have been treated by the "Angus Smith process." I am inclined to think that this might get over a good deal of the difficulty, and that money would be saved in the end thereby.

The exceedingly high chlorine figure suggests that in some way or other there is a communication with the sea. There is a popular superstition that the water in the Behindula nullah has an outlet at Dubar, but this is not supported by the analysis. The large trace of iron comes in part probably from the pipes, as the action of such a highly oxygenated water is very energetic and would be capable of dissolving iron in contact with it.

I do not think that anything can be done to reduce the excessive hardness, unless the water be distilled. It is the hardness which is so largely responsible for making the water unfit for domestic purposes. The water appears to be free from pollution, both animal and vegetable.

(2) *Behindula*.—It frequently happens that water which is highly aerated, clear and very palatable, especially if a water of surface origin, is found to be gravely polluted. The Behindula water affords a case in point. From the analysis it is justifiable to say that it is unsafe and that there is evidence of animal pollution. Considering that there is no protection at the source, that animals come and graze at the spring itself for choice, this is not to be wondered at. New arrivals going up country frequently suffer from severe diarrhœa, and as all water chargols are refilled at Behindula, it would not be unfair to hold it partly responsible.

(3) *Sheikh*.—This station is the hill-station, the pleasant spot, the what-you-will of Somaliland, with its English summer climate, its mountains, and its health-restoring breezes, so it is only in keeping with its reputation that it should have an irreproachable water supply. The drinking water is got from properly steined wells, with coping of masonry round to prevent access of surface washings. The water appears to be a thoroughly good one and free from any pollution.

(4) *Burao*.—The sample was taken from a well on the river bank. The well is about 50 feet deep. There is no coping and the well is liable to fouling from surface washings, especially after rain. It should be protected by a few strands of barbed wire, as the men in charge of the water camels are in the habit of bringing their animals close up to the edge of the well and there make them lie down.

According to European standards the sample is suspicious, but according to the Burao one it is not a bad specimen. Not all Burao samples are as good as the one I took. I have little hesitation in ascribing a good deal of the diarrhœa that has become so prevalent since troops began to crowd in, to the drinking of polluted

water. The so-called dysentery, which is also common at certain seasons of the year, may likewise be put down to this cause *plus* the addition of large quantities of fine mica, which is blown into the wells by the high winds. This appears to set up a kind of ulcerative enteritis.

At Burao the water if possible should always be got from a well sunk high on the river bank rather than in the bed of the dried-up river, and even then should be subjected to some sort of filtration. I can find no excuse for officers who do not insist on finding out where their camel-man is obtaining the water that they are going to use for drinking purposes.

I now come to the waters found in the Ain Valley :—

(5) *Wadamago*.—The water is raised from a cave well in the limestone (it is about 40 feet deep) by lift and force pumps. It is then passed into a primary settling tank of tarpaulin, where it is treated with alum (8 grains to the gallon) and permanganate of potash till it has a permanent pink colour. From this tank it is carried by syphonage into a second distributing one. A good area round the well is zaribaed in with barbed wire, and every care is taken to ensure against surface pollution. There is a 14 per cent. improvement in the character of the water after alumisation and passage through the tanks compared with a 6 per cent. shown at Dubar, where no preliminary chemical treatment is adopted.

The water at Wadamago and in the Ain Valley generally is highly impregnated with sulphuretted hydrogen, and contains a large quantity of magnesium sulphate, according to my estimate about 16 grains to the gallon; 7 grains to the gallon of magnesium sulphate, is usually considered to be enough to cause diarrhoea and dyspepsia, whilst sulphuretted hydrogen also causes excessive purgation. It is true that after a time some sort of tolerance is established, but I can personally vouch for the fact that the first few weeks of one's stay in the Ain are exceedingly uncomfortable ones. The odour of the  $H_2S$  passes away after exposure to the air for a time. The yield at Wadamago is only about eight to twelve thousand gallons per diem, which is not a large supply for 1,200 troops, to say nothing of a camel corps and officers' ponies.

There are probably no means, short of distillation, for reducing the excessive permanent hardness. At my suggestion, Lieutenant Boger, Royal Engineers, has constructed a small experimental sand filter, but at present I am not able to report on the working of it.

(6) *Ainabo*.—The well is of a nature similar to that of Wadamago. The analysis shows it to be a polluted water. This is not



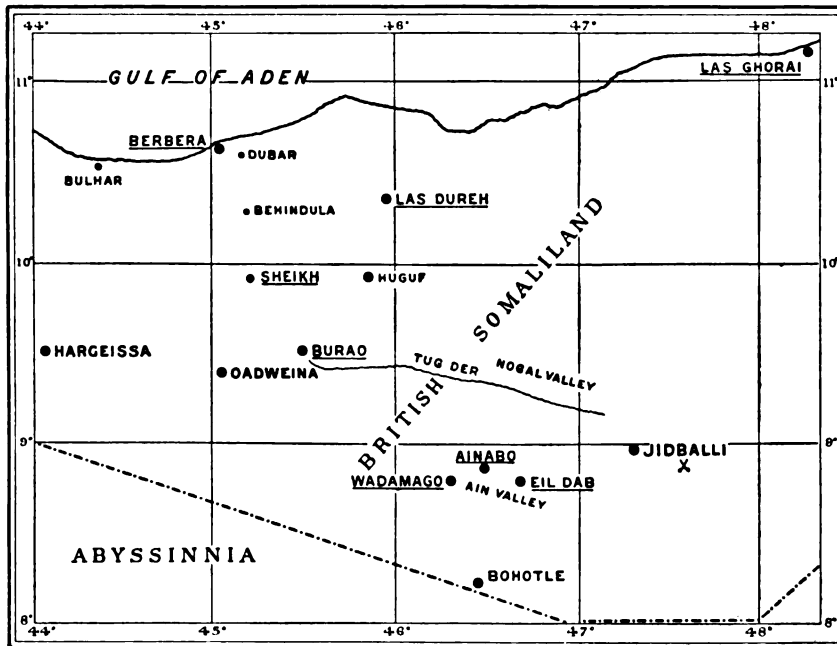
surprising. When I visited the well I found five Somalis washing themselves and their clothing in the well itself. An officer assures me he has seen a Somali actually micturating in the cave. No care is taken to prevent surface washing from running down into the cave and so into the well, and consequently, there is a steady stream of foul matter—liquid sewage it is—from the numberless camels and sheep, &c., that come to water, getting access to the well. I suggested in all seriousness that as long as Europeans are stationed at Ainabo, to say nothing of a whole regiment, that the same precautions should be taken as at Wadamago. It is ridiculous that the claims of Somali stock owners should be considered superior to the most elementary sanitary requirements, especially where British officers are concerned. If the Somali wants water for his stock, then he should be made to pump it up for himself into proper tanks under supervision. To allow him to go into the cave with his dirty habits is simply inviting disaster.

(7) *Eil Dab*.—There are two wells. The one that the Somali karia people use appears to be inexhaustible. It need hardly be said that it is grossly polluted. The other is in the police compound, and, according to local standards, is fit for drinking. The water for European consumption would be improved by alumisation and permanganate treatment. Both wells are even more highly impregnated with  $H_2S$  than those at Wadamago and at Ainabo. At the time of writing *Eil Dab* is the furthest post that is held by British troops in Somaliland, but at any time it may become a very important place, and be occupied in considerable strength. It is a dreadful place to look at, as the country all round is very barren and treeless, and the glare from the sand and rock almost intolerable.

(8) and (9) *Oadweina and Hargeissa*.—Both samples were taken from wells in dried-up river beds. That at Oadweina comes from a very deep one, and the Hargeissa specimen from a shallow one. The difference in the relative purity of the two is well marked, but it is only fair to say that, except in times of drought, the political officer at Hargeissa gets water from his own private well in his compound. Hargeissa is a place that at the present time has no military importance, but it is the headquarters of the district, where all the big-game shooting parties start from, and it is also the last place for water before crossing the Haud on the way to Jig-jigga and Abyssinia.

Las Dureh is a place on the Warsungali border that at any time might become a military base of the greatest importance. Here the wells in the river bed have a tremendous daily yield, and,

if precautions were taken, a very good water could be obtained. There is very good water also to be got at Huguf, where it comes from a spring in the mountain side; owing to its position it is not open to surface pollution.



SKETCH MAP OF SOMALILAND, SHOWING THE MOST IMPORTANT WELLS.

Names underlined indicate military stations.

In conclusion, it must be borne in mind that the present freedom from dangerous intestinal complaints is no guarantee of future safety. Cholera has already visited Somaliland three times at least; fortunately, in each case when large military operations were not in progress, but there is no reason why it should not appear again. The lesson learned in the last Mohmand expedition should not be forgotten in this country. The "cholera carrier" is a very subtle person, difficult to trace and a living danger to the community. Cholera being nearly always semi-epidemic on the Red Sea littoral of Arabia and at Mecca, it is by no means difficult to see how it might be introduced into Somaliland. In view of the grave administrative difficulties that might arise, especially at a time like

## ANALYTICAL RESULTS.

Station	Source and circumstances	Colour in 8 in. column	Odour	Turbidity	Reaction	Residue	Free Saline Ammonia	Chlorine	Cl. expressed as NaCl.	Nitrites Nitrogen as,	Nitrates Nitrogen as,	Oxygen absorbed in 15 min. at 20° F.	Hardness total	Hardness Permanent	Poisonous Metals	Opinion
1 Berbera ..	3 springs at Dubar, 2 settling tanks, temp. at source 104° F., well protected from pollution	Clear	Nil	Nil	Alkaline	Slight, no charring	0.004	4.90	80.85	Nil	Nil	0.03	60.0	48.00	Large trace of Iron	Unfit for drinking owing to excessive hardness and salinity
2 Behindula ..	2 springs open to pollution	Clear	Nil	Nil	Alkaline	Slight, no charring	0.012	12.0	19.80	Nil	0.42	0.03	40.0	20.00	Trace of Iron	Unsafe, but would be a good water if protected
3 Sheikh ..	Steined and protected wells	Clear	Nil	Nil	Neutral	Nil	0.001	11.3	18.63	Nil	0.11	0.03	12.8	5.7	Nil	Safe
4 Burao ..	Well on the ridge of a bank, open to pollution	Clear	Nil	Slight	Neutral	Slight, some charring	0.002	14.0	23.10	Nil	0.14	0.04	24.0	20.0	Nil	Safe, but the source should be protected
5 Wadamago (treated)	Cave well protected by zariba	Yellow	H <sub>2</sub> S Marked	Slight	Neutral	White, no charring	0.050	5.0	8.25	Nil	Nil	0.08	30.66	26.00	Nil (Mag. Sulph. 16 grs. to gall.)	Safe, but purgative
Ditto (untreated)	Ditto	Almost black	H <sub>2</sub> S + +	Slight	Neutral	White, no charring	0.74	7.0	11.55	Nil	Nil	0.10	36.00	26.00	Ditto	Unfit for drinking
6 Ainalo ..	Cave well, no protection, much polluted	Almost black	H <sub>2</sub> S + + +	Considerable	Neutral	White with marked charring	0.085	10.0	16.50	Faint trace	Faint trace	0.07	40.00	30.00	Ditto	Unfit for drinking
Eil Dab ..	Cave well in political compound open to pollution	Yellow	H <sub>2</sub> S + + +	Slight	Neutral	White, no charring	0.080	— not determined	—	Nil	0.14	0.03	44.00	30.00	Ditto	Suspicious
8 Oadweina ..	Deep well in river bed, small coping around	Clear	Nil	Nil	Neutral	Slight, no charring	0.006	4.0	6.60	Nil	Very faint trace	0.04	38.00	30.00	Nil	Safe
9 Hargelissa ..	Shallow well in river bed open to pollution	Clear	Nil	Slight	Alkaline	Slight, some charring	0.008	9.0	14.85	Nil	0.18	0.08	16.00	12.00	Nil	Suspicious

the present, to say nothing of the utter dislocation of external trade, it cannot be too strongly represented that every reasonable precaution should be taken against any possible fouling of the water supplies, at all events at those places where large bodies of troops are likely to be stationed for any length of time.

For some reason or other enteric fever is almost unknown in this country, and though in the last expedition some seventeen cases did occur, they were probably imported from India. At all events, the disease has shown no tendency to spread. In view of the correspondence that has appeared in the *Journal* as to enteric not occurring in West Africa, this may be a matter of interest.

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## PERSONAL RECOLLECTIONS OF THE EARLY MONTHS OF THE SOUTH AFRICAN WAR.

BY LIEUTENANT-COLONEL T. DU B. WHAITE.  
*Royal Army Medical Corps.*

HAVING finished a tour of service in India, on November 24th, 1899, I landed at Southampton from the hired transport "Dilwara," after one of the saddest voyages I have ever experienced. We had on board many wives of officers who had left India for Natal, and at each port gloomy news awaited us.

The prospect of a tour of service in England was not hopeful, and, indeed, at the War Office I learned I was at the top of the roster for active service, and if anything like a *corps d'armée* were mobilised, I should be the first to go. I made a virtue of necessity, waived any claim I had to leave, and was posted to Dublin, where I reported myself on November 30th. On December 2nd I was warned for active service, on the 4th I was ordered to Portsmouth on mobilisation, and after gathering together my field service kit, I reported to the Principal Medical Officer, Southern Command, on the 7th. Next day I became one of the *personnel* of the 3rd Divisional Field Hospital, and as there was no quartermaster available, I was appointed to act as company officer and quartermaster, and buckled to, checking stores with invoices. The weather was intensely cold, and the stores at the old station hospital at Portsmouth a miserable place to spend hour after hour counting the various articles of field hospital equipment, and placing a distinctive mark on each package, so that we should have no difficulty in sorting out our own belongings when we came to disembark at the seat of war.

The *personnel* was as follows: Major (now Colonel) R. W. Ford, myself, Lieutenants Siberry and Wingate, and Serjeant-Major Soule.

As equipment for our officers' little mess, we decided to take with us the following articles:—

Stewpans .. 4	Spoons, wood .. 1	Fork, toasting .. 1
Pudding basins.. 2	„ metal .. 1	Bowl, wooden .. 1
Skewers, sets .. 2	Knife, paring .. 1	Bake pan .. 1
Soup ladle .. 1	Castors .. 2	Gridiron .. 1
Flesh fork .. 1	Coffee pot .. 1	Roller, paste .. 1
Jugs, enamelled 2	Pie dishes .. 2	

In addition to these, each officer had a bucket canteen fitted complete, and a box of the following stores with trifling variations :—

Cocoa and milk	..	tins	24	Butter, Danish	..	lbs.	10
Tea, compressed	..	lbs.	5	Milk, unsweetened	..	tins	24
Jam .. ..	..	tins	12	Marmalade	..	..	lbs. 6
Anchovy sauce	..	bots.	2	Curry powder	..	..	„ 1
Worcester „	..	„	4	Mustard..	..	..	„ 2
Whisky	..	..	2	Tobacco..	..	..	„ 3

A traveller's Berkefeld filter completed the equipment, but by some mistake it was not put in the box of stores, and I did not get it until many months afterwards.

On December 29th, 1899, we all embarked at Southampton in the hired transport "Orient," Captain Kershaw. The other troops on board were the 1st Battalion West Riding Regiment and details. We had four horses on board, including mine—a nice, sturdy, brown cob. It was blowing so hard that we anchored for the night off Hurst Castle, and dropped into the English Channel early next morning.

The voyage to the Cape was not very exciting. The time on board was spent in giving inoculations against enteric fever, learning the semaphore, taking as much exercise as is possible on board ship, and filling in the rest of the time with reading, music, cards, sketching, &c.

We coaled at St. Vincent and had a run on shore. The place is just like a cinder, barren and dry; the only green to be seen is a scanty amount in the ravines by the seashore, and some trees in the main streets and at the offices of the telegraph company. All the vegetables come from a neighbouring island, San Antoine, which is very fertile. As we approached Cape Town we were caught in a fog for several hours, and when it lifted found we had overshot the entrance to Table Bay, and had to steam north until we got our bearings, and came to anchor about 1 p.m. January 19th, 1900.

The embarking medical officer informed us we were to proceed to Naaupoort, and after we had come alongside the wharf we unloaded the ship and packed our field hospital into two railway trucks. This kept us busy until after midnight, working as hard as we could; but thanks to the distinctive mark—a large yellow cross—which we had painted on each package before we embarked, the labour of sorting out our equipment was greatly reduced. Next day we left our swords at an agent's office in Cape Town, and wearing Sam Browne belts only, we entrained at 1.30 p.m., and after forty-two hours or so the main body reached their destination.

I was dropped at De Aar to get the transport, but, as Lord

Kitchener had modified the scale, I only drew another water cart, twelve mules, and four horses, with harness and saddlery. The horses were all rather thin, except one Argentine, but I soon found out that the Cape horse does not, as a rule, carry much flesh, and these were wiry and stood the work well. I remember being rather puzzled, in reading the lists over, to make out what a "bugle, belly, leathered" might be, until I found it was the Cape equivalent for our old friend the tonga-bar, only that it hung in two curves under the animals, instead of being fixed on top of the saddle pad.

I got my wild lot of mules and ponies and the Cape boys into trucks and left De Aar about 1.30 p.m., travelling in the brake van, and got to Naauwpoort late at night, and had the greatest difficulty in finding our camp among the many which lay around the town, as nobody met my train at the station; and before I left I had to see all the beasts fed and watered in their trucks, and leave them to detrain next morning. There were very few lights about the railway lines, and several times I barked my shins badly over the point levers and other obstacles.

We had been in occupation of our camp for a day or two, and had got everything pretty orderly, and finished drawing our equipment, when we were ordered to shift our ground to another situation about a mile away. Four days later we were sent back again to our old position, and although it was looked upon at the time as rather a nuisance, it really was a very good piece of practice in packing and loading our field hospital, and showed our men how to do it better than any amount of lecturing.

I find in my diary that eggs here were 2½d. each, but that price was beaten in Johannesburg afterwards, when they fetched as much as 9d.!

We found that English saddlery needed much alteration to fit the razor back and smaller girth of the Cape ponies, and we took advantage of our rest in Naauwpoort to shorten girths and surcingles. Breastplates also hung like festoons on the horses' chests, and being on the whole quite unnecessary, we discarded them. The dust and wind were perfectly beastly, and every day we were treated to a heavy duststorm, until it culminated in a thunderstorm on January 29th, which cleared and cooled the air.

On February 2nd, we packed up our camp, "trekked" to the railway station, and were getting our belongings into the trucks most comfortably, when a certain senior officer came along and altered all the entraining arrangements and made himself generally unpleasant to everybody, and I doubt very much if he succeeded

in pleasing himself. He did not belong to our corps nor to the staff of our division. Later in the day we left with General Kelly-Kenny and his staff, and with that occurred our first change of designation, and we were styled the Field Hospital, Divisional Troops, 6th Division; so good-bye to all our letters until our new style and title become known to the Field Post Office.

Modder river was our destination, and there we landed too late to detrain that night. Next morning we shunted to the Bloemfontein siding, got out our baggage, and encamped close by. There were signs of battle all around. Boer trenches, empty mauser cases, and houses well battered by shell fire. Our old enemy the duststorm again attacked us at 5 p.m., and blew unceasingly for two or three hours, making everything abominable. The sun at that time of the year was intensely hot, and although there was a portion of the river bank labelled "officers' bathing place," we were too busy for a couple of days to take advantage of it. Those days at Modder River Station were a perfect succession of sandstorms, and the sun between whiles was scorchingly hot; no shelter was to be had for the animals, and my cob got fever and his eyes were swollen up from the glare of the sun and the irritation of the sand. He was so bad that I was obliged to leave him behind when I started off on February 9th for Enslin with all the horses of the medical units and nearly all the water carts and ambulance wagons. All our kit had been cut down to the lowest scale consistent with efficiency; we were moving with few tents and the lightest possible equipment; in fact, we were the advanced party of Lord Roberts' great turning movement, and the remainder of our equipment was to follow by train next day. We sent our portmanteaus to Cape Town, and, wonderful to relate, they all got there safely. At 2 a.m. I left with the advance guard, which included a field company Royal Engineers, *en route* for Enslin *via* Klokfontein and Honeynest Kloof. We had no lights and the night was very dark; but after we cleared the outposts the track was fairly easy to keep to. At 8 a.m. we halted at the last-mentioned place to get some breakfast and feed and water the animals. The spring for the latter was about  $1\frac{1}{2}$  miles away, up a gorge, and it took a long time to go there and back and water all the beasts.

We reached Enslin at 1 p.m. on the 10th, and were joined there next day by the remainder of the medical units, and all moved to Graspan except myself, who was in the position of a "*mud major*," and was moreover left behind to find one of our mules that had strayed in the night. Our Cape boys had marked



our animals by clipping their tails in rings, but as the tails of the mules of unscrupulous drivers were almost devoid of hair, it was obvious that a "close crop" was the mark *par excellence* for a commandeered team. I discovered our mule among the team of another unit, and after some trouble got possession of her.

The difficulty about a horse was surmounted by my taking charge of a mount intended for Major Sylvester, of Ours, and riding him as far as Grasspan, which I reached by mid-day. We drew two buck-wagons at Enslin, and in this we were more fortunate than some, for Majors Sawyer and Raymond, R.A.M.C., had no transport whatever, and we left them behind. At Enslin I first saw a wireless telegraphy installation, but the man in charge said it was no use and only kept muttering some unintelligible *gibberish*. The inefficiency was attributed to the quantity of ironstone in the kopjies close at hand, but I now think it must have been due to placing the mast on the low ground between the hills. Our halting-place at Grasspan was on fine red sand, exactly resembling that used in egg-boilers, and it simply penetrated everything, and with a strong wind blowing made us very uncomfortable. The staff officer here—an Irishman, whose father I knew in India—with a keen sense of the ludicrous, had chosen "*cheerful*" as the password for the day!

Four o'clock in the morning saw us started off straight across the veldt for Ramdam, 15 miles away, and when we got there we took possession of a small grove of trees for our hospital, but a brigadier-general turned us out and we had to camp in the open, where, during the night, a runaway buck-wagon dashed through our lines and was within an ace of crushing my head. The water for the animals was good and plentiful, but the same cannot be said for the troops' supply. It was rather a nice farm, with poplars, fig-trees, pumpkins, and vines. Fresh beef was issued to us. The nights were brilliant moonlight, and I wrote the notes in my diary by Selene's fair beams. Dust, I may state, was as usual plentiful, and the fine peaty particles suspended in the air enhanced the glory of a magnificent sunset by throwing a haze over the foreground. The march from Ramdam to Waterfall Drift on the Reit River was about 8 miles and fairly good going, but as we did not start until late in the day we had to negotiate the Drift in a duststorm which came on at dusk. It was a terrible business getting the wagons over, and after a hasty meal we turned in, as we had been warned for an early start next day. The force moved off at 1 a.m., and it was a most wearisome procession. The night

air was very chilly, and we kept dropping asleep in our saddles, to be aroused by the pony stumbling into a hole or deep rut. Like so many South African animals, my mount refused to be led, and after several attempts to keep myself warm by walking, I had to abandon the effort.

With the dawn of February 14th we came on large flocks of sheep and goats, and many were slaughtered by the troops, joints cut off hastily and carried on, while the bulk of the carcasses were left on the veldt. An enormous quantity of good meat was thus wasted. I got a big draught of sour milk at a Kaffir kraal and found it very refreshing. At 10 a.m. we got to Wegdraai and found that many of our mules were badly galled, and the buck-wagons we got at Enslin were very rickety about the wheels. I wedged them up as best I could, and put some sacking on the naves to be kept wet and swell the wood. Our mules were feasting at night off the "*disselbooms*," and would have eaten the wheels if they could have managed the tyres. We nailed some biscuit tins on the poles and put a stop to further destruction. Here we got news that Jacobsdaal was captured, and the Boer supplies to Magersfontein cut off. Orders came to push on, and the same evening we inspanned and marched until midnight, when we turned in on the trail and slept until morning.

February 15th.—Klip Drift and heavy rain ; thousands of troops here, and more batteries and cavalry coming in. At 9 a.m. the artillery were busy shelling the enemy, and we, though we knew it not at the time, were earning our clasp for the Relief of Kimberley. Six or seven Boer prisoners were brought into camp, and all were wearing red crosses !

At 7 p.m. we received a signal from General French saying he was dining at the club in Kimberley, whereat great cheering broke out in camp. Next day I was detached from my hospital by the Principal Medical Officer, 6th Division, and sent to the 13th Brigade Field Hospital to assist in dressing the wounded. While we were busy with that, somebody annexed the Serjeant-Major's khaki jacket. I happened to be wearing two, as I had donned an extra one on account of the cold at night, so I lent him one, and, being a small man, he looked quite lonely in the garment. He returned it to me a few days afterwards and told me he had replenished his wardrobe from a dead "Buff."

In the farm outbuildings I came across a bowl that had been used for oil paint, and when I had scraped it and scoured it with sand, I found it was a choice piece of Crown Derby ! It was the

visitors' porridge-bowl afterwards in hospital, for being so fragile I could not carry it about, and left it behind when I departed to take charge of the Essex Regiment. Years afterwards, Colonel Rhodes, the Signalling Officer of our Division, who used often to mess with us, remembered the basin, and made tender enquiries for it. I expect it was broken eventually.

Civil-Surgeon E. took charge of the wounded, and I made my way to Klip Kraal, when I came up with the 13th Brigade Bearer Company, who very kindly regaled me with a cup of haricot beans and a knuckle of mutton. In their company I set out again for the front, at 5 p.m., and we lost our way in the dark. Fortunately, we found the farmhouse of a Scotchman named McC., who was away in Kimberley. Mrs. McC. sent her little son Philip with us to Brantvlei Drift, over the Modder River, after crossing which we outspanned and lay down to rest, just as the Highland Brigade were passing us on their way to the field of Paardeberg.

The Boers, I believe, speak of this action as the battle of Osfontein, from the farm on which most of the fighting took place. Paardeberg Farm lies on the opposite side of the river, and more to the west.

Sunday, February 18th, 1900.—We marched at 5 a.m., and *en route* got some small grapes and pumpkins from a garden, and in a farmhouse found some potatoes and haricot beans, which we annexed. Our animals, as well as ourselves, were feeling the effects of short commons, and, as our ambulances were empty, we put in a couple of sacks of oats we found on the road, and hurried on towards the sound of firing in front.

I found my hospital in the shelter of Stinkfontein Kopjie, busy dressing the wounded, and we worked hard at it all the day. We had planted our Geneva Cross flag with the Union Jack on a clump of rocks between our hospital and the river, the distance from the latter being about two miles.

In the afternoon we came under "pompom" fire, and a bullet came through the tent while we were operating on Major K., who was wounded in the neck. As the firing kept up, I thought that perhaps our flagstaff had been knocked over, but I found it there all right, and a staff officer with mounted orderlies clustered round the spot. The officer was coolly writing despatches, but he withdrew when I politely called his attention to the fact that he was drawing the fire on our hospital. The Boers seem to have got hold of the idea that the Union Jack marked Lord Roberts' headquarters, and the fire later on became so hot and continuous that we were

obliged to evacuate the position altogether, and leave our tents standing. A pompom shell struck a camp kettle full of beef tea, and spilt the contents. One watercart had gone to the river earlier in the day, as we were assured by a staff officer it would be quite safe, but we never saw it again. Last of all, we moved the flag, which Lieutenant W. and I secured under a hot fire.

We had only two ambulances, and these went backwards and forwards until the mules could do no more, and between the trips we worked like blacks, assisted by Major T. and some men of the West Riding Regiment, to get the wounded to a place of safety. Carrying a heavy man any distance in a blanket (not an improvised stretcher) is a most painful thing for the fingers and nails, and I found that a small stone or a firm bundle of grass twisted up in the border of the blanket gave a much better grip and rested the fingers.

All night long the cries of the wounded and their calls for water were heartrending, and we had none to give the poor fellows, and, not knowing where to go, we had perforce to remain until dawn revealed a suitable place to pitch our camp.

All corps and ranks seemed mixed up and lost that night. We had generals and their aides-de-camp trying to snatch a little sleep on the ground by our wagons, and we all felt pretty miserable, but by the greatest luck nobody of our corps or party was wounded.

Next morning we moved from our dreary bivouac to a shady place under the trees on the bank of the Modder River, and dressed cases until the Principal Medical Officer sent me to take temporary charge of the Essex Regiment, *vice* Captain S., who was ill. On my way across the plain I fell in with some of the Mounted Infantry, and being shelled was compelled to retire. Then finding that the shells were following the Mounted Infantry, I changed my direction, and this brought me nearer to the river bank and the Boer entrenchments, which, much to my surprise, I found were occupied by Boers on our side of the stream. Several of the enemy came out and we entered into conversation. They told me they had asked for twenty-four hours' armistice, but had not got an answer; in the meantime they were not fighting. I told them I was a surgeon going to attend to some wounded, and then we parted amicably.

I found half the battalion of the Essex Regiment on the river, concealed in a *donga*, while half were on the other side. There were seven wounded from the assault on the laager on Sunday, and placing two of the worst cases on stretchers, I started to return

to hospital. Fortunately, I insisted on my party going unarmed. Soon after we left a small party of the Welsh Regiment also made a move to return from the river, and the Boers at once came streaming out on their ponies and caught me in the open. Bullets were flying all round us, so I made the bearers lie down and place the stretchers parallel to the line of fire, to give the men on them a better chance of escape. My horse drew the fire so much I let him go loose, and the Boers captured him and were taking him off to the laager with pretty nearly all my belongings on the saddle. When the enemy made us rise and hold up our hands I fortunately recognised one of my friends of the morning and remonstrated strongly with him for taking the horse, and when they found we had no arms they returned him to me, but took up a position round my stretchers and fired on the Welsh, trusting they would not return the fire for fear of injuring any of my party. On my objecting to this unfair advantage they retired, and I made my way unscathed to the artillery position. Here Captain W. rode up and announced that Cronje had surrendered unconditionally, and the news was received with great cheering and tossing of helmets. It turned out, however, that he was a little previous, for firing almost immediately recommenced from the laager and our guns replied. After this incident I always moved about with a small red cross flag on a broom stick.

On the 20th I rejoined the Essex Regiment by the river and found them very short of food, and we dared not light fires to warm anything, as we got shelled whenever we tried it. Our emergency rations had to be opened and consumed.

Early next day General Chermiside's Brigade, consisting of the Norfolk and Lincoln Regiments and the King's Own Scottish Borderers, was heavily fired on at dawn from the laager and Stinkfontein kopje. They had been moving to relieve us late the evening before, but not knowing the way, had halted and bivouacked within 600 yards of the Boer lines. They were very smart in-spanning under fire, and got to the river with only ten casualties, which I helped to dress.

A convoy of food for the Essex Regiment had to turn back, much to our chagrin.

The Stinkfontein kopje, opposite to us, had been a constant menace since the Boers occupied it on Sunday, and General Chermiside decided to take it. It seems the enemy simultaneously decided to evacuate it, or else they were threatened by another force in their rear, for we saw them slipping off towards Osfontein

Farm in batches of a dozen or so. The Maxims were got to play on them, but apparently did little or no harm. The kopje was occupied and about forty prisoners were taken, who being unmounted were unable to break away.

It was curious I should meet the 2nd Battalion of the Lincolnshire Regiment on the field of battle, as I was born in that Battalion at Preston in 1862, and the Colonel, though he had never met him, had often heard of my father. With the Essex Regiment I made my way back to headquarters without further adventure, and assisted during the daytime at the hospital and slept at night with the Regiment. Heavy rain came on nearly every evening, which made the soil very stiff and holding to walk over. Tents were only to be found with the field hospitals, and very few there; the men were sheltering themselves as best they could under blankets, and though these latter were so scarce I found the dead were in some cases being wrapped in them for burial, until my representations put a stop to it. About this time I exchanged Major Sylvester's "crock" for a Boer pony, and he did me very well until we got to Bloenfontein, where I picked up my own horse.

On February 24th I was finally detached from my hospital and put in medical charge of the Essex Regiment. During the wet weather I found it an excellent plan to throw up a small mound, the size of the valise, so that my bed-place was above the general level of the ground, and the trench carried off the water. The large waterproof sheet formed a covering which, by a simple contrivance with a string and a picketing peg, could be pulled over the head without trouble, in case it came on to rain during the night. A hollow for the hips and some brushwood to mitigate the hardness of the ground was a refinement of luxury.

Literature, needless to say, was very scarce; a few magazines found their way to us by the post and were eagerly devoured, and a copy of Shakespeare which I had with me was always in great demand. It was very small print, and the margin being cut down made it quite a portable volume. We soon became very learned in his pithy references to the tented field.

Being now permanently severed from my connections with the field hospital, I collected my goods and chattels, which included my little box of stores and a light camp chair of the Roorkee pattern. The latter had a leg broken, but I was able to repair it with an old picketing peg and some strong string. Whenever our Brigadier or any distinguished stranger visited the mess he was accommodated in it, and the leg still remains as originally repaired.

There were at this time all sorts of rumours flying about anent

a contemplated sortie of the Boers, and extra precautions were taken to prevent their escape should they attempt it. As it was the eve of the anniversary of Majuba it was thought they would make some attempt, but we felt prepared.

*Majuba Day.*—At 3 a.m. we were aroused by a furious fusilade from the direction of the laager. We heard afterwards it was an assault on the Boer position by the Canadians, who had been sapping up for some days past on the other side of the river. Unfortunately, the attempt was unsuccessful and the losses considerable, but it undoubtedly had an effect in bringing the enemy to their senses. A good bombardment of the position by four 6-inch howitzers completed the business, and Cronje surrendered unconditionally with 4,750 men, practically all unmounted, as those who had ponies all got away in small parties during the early days of the investment.

It was indeed a motley crew that fled away under escort, dressed in all sorts of garments, everyone with a bundle of blankets or rugs, many with umbrellas, and one man I saw carrying a hand-bag and a small animal rather like a guinea-pig, dark brown in colour, and probably a large veldt rat or marmot, whose holes render the riding so unpleasant. Two ladies drove away in Cape carts drawn by mules. I heard that one of them was Mrs. Cronje herself.

The trenches which I examined were very scientifically constructed, and so deeply under-cut as to be practically shell-proof. They were littered with any amount of old rugs, blankets, coats, trousers, &c., as the men only took away with them what they absolutely needed and could conveniently carry. I appropriated an old flask, with a leather cover and a raw-hide sling, to replace my own, which had been broken some time back.

The rifles handed in were piled under a tree with a guard, and included many modern sporting weapons. I coveted, but could not obtain. Major N., of the Essex Regiment, found two saddle-bags full of flour and some baking powder, and I came on some mushrooms growing under a tree; these furnished a tasty addition to the mess lunch, and with the flour I made some capital scones for tea, and baked them between two camp kettle-lids, with hot embers above and below.

Next day the river was in flood, and some of us who had intended inspecting the trenches on the opposite banks did not see the force of getting wet through. An ambulance had stranded in mid-stream, and an ox-wagon which crossed the drift while we were there was nearly swept down with the current, and the oxen were almost swimming. I made a couple of pencil-sketches of the scene.

The country being now quite clear of the enemy, I induced the officer in command of the battalion to fetch water for the men from the spring at Osfontein Farmhouse, as the Modder River water had given nearly everybody diarrhoea (familiarily styled "the Modders"). I remember figuring out the advantage of fetching the water three miles, and how many journeys would have to be made daily to draw enough; and it was finally so arranged. But we only had the trouble one day, for we moved to Osfontein Farm itself next morning. This must have been a very prosperous homestead in the days before the war. The garden was well cultivated and stocked. We found some men busy digging up carrots with a clasp knife; two or three more had just discovered a bed of chillies, and the bright red colour tempted them to taste. The subsequent language was hot and strong! Lord Roberts had his headquarters in the farmhouse, and while making a sketch of it I mislaid my only piece of india-rubber!

On March 2nd we received news of the relief of Ladysmith; Kimberley and Mafeking also relieved, and General Clements again in possession of Colesberg, made the general complexion of affairs decidedly more rosy.

We were expecting to remain here for several days until we had a fortnight's supplies collected. We got mails from the base, and I heard that my horse had completely recovered and was fat and well.

My new mount was very razor-backed, but I got hold of a very thick saddle-blanket and a leather saddle-cover, which had been abandoned by the enemy, and these were very useful until somebody commandeered the blanket. The saddle-cover I still possess and often use in rainy weather.

We were all on short rations, and I find a note in my diary that I was always most infernally hungry, and a little further on I read, "Made a wholemeal cake, great success."

We were, during that week after the surrender, always prepared for sudden orders to move, and on March 6th we were warned to be ready for an advance at 3 a.m. next day. This we did, but made slow progress until daylight, when we moved in extended order on a line of kopjes known as the Seven Sisters.

The guns searched the position, and the cavalry and mounted infantry reconnoitred and reported them evacuated. We did not fire a shot, and we found the Boers had decamped in a hurry, leaving one man dead. The tents and shanties remained standing and we made a welcome haul of flour, meal, potatoes, and onions. There was also some biltong hung on the bushes, but we did not fancy it.



Platteberg was our next move, and here also we were unopposed, and finally we encamped at Poplar Grove at nightfall, having been fifteen hours under arms. Distance from last camp 15 miles, but as we came, about 25 miles.

Next day we moved off at 10 a.m. for Waaihoek Drift. Four of us had made our breakfast off a small tin of sardines with potatoes and onions. Want of rations handicapped both man and beast. Kruger and Steyn got away from Poplar Grove Farm because the cavalry horses were so cooked they "*could not boil a trot*," as one of the officers lucidly put it.

Our men broke into and devoured their emergency rations without the formality of an officer's order. Before leaving Osonfontein they received rations for two days, but before we reached the next camp they had eaten all. A parade of the Battalion mustered, as well as I remember, only two emergency rations, and they were believed to have been stolen!

March 9th was spent taking a well-earned rest, and on the 10th, at 6 a.m., we marched off, hoping to reach Baber's Pan by the evening. Near Driefontein, however, we found the Boers holding in force a line of kopjes on our front and on the left flank. The infantry were extended and the guns shelled the position.

Thousands of buck galloped past our front, and one which was struck by a rifle bullet was picked up and carried along by two men. When further extension made separation necessary, one man took the buck on his shoulders and continued to skirmish. During the attack Captain B. was wounded in the calf of the leg by a spent ball, which just sank in level with the skin. I extracted the bullet and dressed him and a couple of other men with slight wounds and pushed on to rejoin the Battalion. Our Brigadier with his aide-de-camp got past the end of the kopjie in safety, but just as I passed by the same spot the Boers recommenced to search with a Krupp ten-pounder, and a shell burst almost in my face. A bullet struck me in the right breast, passed under the pectoral muscle, turned on the ribs, and emerged, after ploughing a track about 6 inches long, at the fold of the axilla, and passed out under my arm. It smashed up the vulcanite mouthpiece of a pipe I had in my right breast-pocket. I went and reported to the Principal Medical Officer, who sent me to my old Field Hospital, and a civil surgeon was sent to take my place with the Regiment. It turned out afterwards that large pieces of my jacket, shirt, and vest were carried into the wound, as well as bunches of chest-hair, and it took thirty-five days before it completely closed up.

Next day I moved to the 13th Brigade Field Hospital, com-

manded by Major W. W. Pike, and helped as best I could in establishing a temporary hospital in the farmhouse. Then I met Lord Roberts, who very kindly sent a telegram for me to my wife, who received it half an hour after she saw the report of my wound in the papers.

It was a dearly bought victory for the Essex Regiment, who lost two officers killed and several wounded. All that day the wounded were being brought in, and many of them were seen by Lord Roberts before he left, and he also sent Lord Kerry to bring in a batch of twenty who were collected under the lee of a hill. Major Pike arrived last in the hospital late in the evening.

With my right arm bandaged to my side I gave all the help I could by administering chloroform and supervising dressings, &c. I had a great deal of trouble the day before preventing all and sundry from digging up a patch of new potatoes and carrots in the farm garden, and it was only by posting a sentry that we managed to save as much as we did to supplement the rations of the wounded. A good flock of sheep was driven into the kraal to feed us, and an old farmer from Abraham's Kraal, 9 miles away, drove over with milk, and was most pro-British in his sympathies. His daughter and a governess drove over in a Cape cart one afternoon and we gave them tea. The governess prided herself on being an Afrikaner, and tried to gather indirectly what steps Lord Roberts had taken to safeguard his lines of communications! Major Pike set her mind at rest by informing her we were only the advance guard, and that 50,000 men were close behind. Doubtless this valuable piece of information filtered through to the enemy, who refrained from tampering with our rear; for convoys and my horse came through on subsequent days unmolested *via* Kimberley, and a battalion of the Royal Warwickshire came *via* Jacobsdaal to Bloemfontein and saw nothing of the enemy. On the whole we lived very well and made some purchases of luxuries from the old man's shop to supplement our rations. We cut cartloads of rushes from the *Pan* near by, and made comfortable beds for the sick and injured.

In the field hospital equipment, 1898 pattern, there was no means of sharpening the surgical instruments—an oversight that has been remedied in the new pattern panniers. Fortunately, I had in my kit a small Arkansas stone, with which I was able to keep the knives in order.

A week after the battle three ambulance wagons turned up from Panfontein, and Major Pike asked me to take ten officers and two men into Bloemfontein. We started at 5 p.m., and halted

for the night at Aasvogel Kop, near the deserted school of one, Mr. Minaan. The locality was very offensive with the carcasses of dead animals, but we had to put up with it, as we could not pick and choose in the dark. In the morning we moved on, passing on our way Troon's Farm, where we all filled our water-bottles and casks with the best water we had come across for a very long time.

Twelve more weary miles brought us to Daniel's Farm, Hartebeest Hock. The last three miles of the road was a winding track amongst immense boulders, and our way was illumined by almost continuous flashes of lightning from a terrific thunderstorm, which raged for over an hour. At 8 p.m. we got in, and Mr. Daniel and his family made us heartily welcome and gave us supper. I was accommodated for the night in a double-spring bed with white sheets and feather pillows—in fact, in the lap of luxury. Early on the morrow I was up and about and found Mr. Daniel pottering about the dewy grass in his bare feet (Kneip's cure for rheumatism) and he took me round the farm and dairy. Breakfast consisted of a generous *menu* of porridge, venison steak, mutton chops, grilled chicken, and hot scones, to which, needless to say, we all did ample justice.

Amid cordial good-byes we left at 8.45 a.m., and arrived at Bloemfontein at 1 p.m. We were met by General Kelly-Kenny, Colonel Benson, and our Principal Medical Officer, and carted straight away to the Victoria Cottage Hospital, there to be healed of our wounds by the ministering care of the Sisters of St. Michael. Thus ended the first phase of the war so far as I was concerned.

My experience during these months of the war convinced me of the necessity of having a sanitary officer, with influence and tact at the headquarters, to confer with the general, and not only to advise on the suitability of the camping ground generally, but to assist in fixing the sites for the various hospitals and in posting guards to prevent the ground being fouled by the first arrivals.

It almost invariably happened that sheltered or shady sites, which were most fitted for the accommodation of emergency cases, without incurring the delay of pitching tents, had been used by shy and hypersensitive men as *al fresco* latrines, and had to be cleaned up for occupation by the medical units on arrival with the rear of the columns. With the sanitary squads as at present organised, I anticipate no difficulty in obviating such an objectionable state of affairs in future campaigns.

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## Clinical and other Notes.

### "TRAITEMENT À VIDE" OF ENTERIC FEVER.

BY CAPTAIN N. E. HARDING.

*Royal Army Medical Corps.*

IN view of the exalted claims made by Lieutenant-Colonel G. Cree for the so-called "empty bowel" treatment of enteric fever, and the fact that so many of our officers have no opportunity of consulting many medical books or papers, it seems well that the claims should be carefully examined. They are that "it is based on the highest scientific principles," that it "surely must be looked upon as the only rational method of treatment of enteric fever at the present time," and "that they have in the empty bowel method a plan of campaign that excels anything that has gone before."

Lieutenant-Colonel Cree regards three pints of whey as ample for a patient in the early stages of the disease, and in addition gives "plain chocolate to suck," though presumably only in small quantities, and not till the patient is recovering. Now whey<sup>1</sup> has the following compositions: Water, 93.64 per cent.; proteid, 0.82 per cent.; fat, 0.24 per cent.; sugar, 4.65 per cent.; mineral matter, 0.65 per cent.

It follows, therefore, that 3 pints would contain approximately 14 grammes of proteid, 4 grammes of fat, and 80 of carbohydrate, with a total energy value of 422 calories. Supposing 100 grammes of chocolate (approximately a quarter of a pound) to be given in addition, the proteid would be raised by about 8 grammes and the total calories brought up to about 900. It is not apparently known to what extent the increased tissue waste of fever makes up for the saving due to complete rest in bed, but it may probably be safely assumed that not less than 50 grammes proteid and 2,000 calories are needed daily, and very likely a good deal more. It is evident, therefore, that the treatment is essentially starvation. Now starvation was the sole treatment of fevers from the time of Hippocrates to the middle of last century when Graves desired it to be inscribed on his tombstone that "he fed fevers." Dr. Ewart<sup>2</sup> in his paper makes no claim to originality either as regards the "empty bowel" or the use of whey, but points out that logically water and only water had been used by Luton, of Rheims; and unless my memory deceives me Sir W. D. Wilson in his evidence before the South African Commission advocates it. It must, of course, be frankly admitted that if the advocates of this

<sup>1</sup> "Food and the Principles of Dietetics," by Robert Hutchison, M.D. Edin., F.R.C.P., p. 132.

<sup>2</sup> *British Medical Journal*, December 9th, 1905.

method of treatment can show exceptionally good results mere *a priori* reasoning such as the above is valueless; but can they? Lieutenant-Colonel Cree evidently thinks his series of twenty-nine consecutive cases with no deaths so remarkable that he italicises "consecutive" and "no deaths." In this connection it may be well to quote the words of one who has probably treated many thousands of cases of enteric.<sup>1</sup> "Again, there is hardly any disease for which specific drugs and lines of treatment are more loudly vaunted. Often, the evidence on which the favourable opinion is based is of the most slender kind; two or three, or at most a dozen cases. On the other hand, the number of cases sometimes runs to a hundred or two, with a case-mortality of from 0 to 4 or 5 per cent." To give some instances: One unknown author<sup>2</sup> treated 172 cases with 1 death by sulphurous acid; O. F. Paget<sup>3</sup> treated more than 100 cases without a single death by means of olive oil in large quantities; Sir James Barr<sup>4</sup> treated 55 consecutive cases in a tank with only 1 death. Thistle<sup>5</sup> treated 100 consecutive cases by daily purging with calomel and salts, and only lost 2. Without any disparagement of Dr. Ewart, it may be pointed out that he is, or rather was, physician to a general hospital only, and so would probably have few cases of enteric to treat, and indeed he only mentions two in his paper. On examining the details Lieutenant-Colonel Cree gives of his 29 cases, it appears that the average duration of the fever was twenty-seven days, so that the treatment has apparently no effect in shortening it, and that hæmorrhage occurred in 2 cases—surely by no means a low percentage—and that in most of the shorter cases Vidal's reaction was negative, so that it may well have been the case that some of them were paratyphoids, in which the mortality is notoriously low. In the great bulk of the cases no information is given as to their after-history, but merely the note "Recovered," which may mean that on the date in question they were transferred to a convalescent camp, while the short interval elapsing between admission and "To duty" in some of the others presumably means that though they had returned to the ranks they were naturally not fit for anything very arduous in the way of duty.

Now let us consider the results of liberal feeding; Barrs<sup>6</sup> gives meat as soon as the patient is hungry, and up to the publication of his paper had treated thirty-one cases with three deaths, none of the fatal cases having had meat. He gives details of two cases, one showing the effect of "ordinary mixed diet with minced meat" on a patient with a tem-

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<sup>1</sup> E. W. Goodall, *Medical Annual* for 1905, p. 598.

<sup>2</sup> *British Medical Journal*, February 25th, 1905.

<sup>3</sup> *Lancet*, November 27th, 1897.

<sup>4</sup> "Treatment of Typhoid Fever."

<sup>5</sup> *British Medical Journal*, October 20th, 1906.

<sup>6</sup> *British Medical Journal*, January 16th, 1897.

perature of 102° F. Shattuck<sup>1</sup> gives minced meat, puddings, toast, blanc-mange, and soups made with tomato, potato, &c., but gives no results. Marsden<sup>2</sup> treated 200 "unselected" cases with bread and milk, custard, chicken, &c., in half of them giving fish prior to defervescence. He does not give his case-mortality, but had no case of perforation and only six of hæmorrhage, none of which were fatal, *i.e.*, the same result as regards perforation, as Lieutenant-Colonel Cree obtained and only half as many cases of hæmorrhage, with seven times as many cases. Vaquez<sup>3</sup> uses milk, soups, meat, jelly, &c., and has had good results, but gives no figures. Snell<sup>4</sup> treated 100 cases with only one death, using 4 to 6 pints of milk daily and early solid feeding. Bushuyez<sup>5</sup> has treated 318 cases with a mortality of 8.2 per cent., losing not a single case from hæmorrhage, on the following dietary:—

" 7 a.m.—Tea and roll.

" 8 a.m.—14 ounces of gruel (oatmeal, barley, or wheat), with butter.

" 9 a.m.—One or two boiled eggs.

" 10 to 11 a.m.—A glass of milk, a roll, half a cutlet, and a bit of boiled meat.

" 12 to 12.30 p.m.—A bowl of soup and a little jelly.

" 3 p.m.—Tea and a roll.

" 6 p.m.—A cup of soup, a bit of chicken, and milk pudding.

" 8 p.m.—A roll and milk.

" During the night coffee or tea, with milk, is allowed several times."

Seibert<sup>6</sup> treated sixty-one cases with only one death on rice, pea, lentil, &c., soup.

My own experience of late years has been very limited, but when I did treat cases of enteric in large numbers I was altogether convinced of the advantages of a liberal diet, so convinced as to be a source of alarm to my chief, who had been accustomed to more classical methods. By this I do not mean that an early case was forcibly fed; on the contrary, if he wanted to he was allowed to starve, but as soon as he wanted food he was given large quantities of milk, bread and milk, jelly, custard, soup, eggs, and so on; and so there was never the risk of a starving man procuring unsuitable food illicitly. Surely the fact is that every case should be treated on its own merits and not on routine lines, and then "that intense craving for food, which is invariably present" may be gratified with impunity. At any rate, it is obvious how little relation there is between the full bowel and

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<sup>1</sup> *Journal of the American Medical Association*, July 10th 1897.

<sup>2</sup> *Lancet*, January 13th, 1900.

<sup>3</sup> *Presse Médicale*, February 10th, 1900.

<sup>4</sup> *British Medical Journal*, February 25th 1905

<sup>5</sup> Hutchison, *op. cit.*, p. 488.

<sup>6</sup> *Medical Record*, 1908.

"the resulting constant fear of hæmorrhage and perforation, which we all must have met with when treating enteric fever on other lines" (*i.e.*, than the empty bowel).

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#### A CASE OF THROMBOSIS OF THE LATERAL SINUSES.

By CAPTAIN L. BOUSFIELD.

*Royal Army Medical Corps.*

AN Egyptian soldier, aged about 25, was admitted to the general infirmary, Cairo, on June 2nd, 1909. He stated he had been feeling unwell for about six days, suffering from headache, constipation and vomiting.

*Condition on Admission.*—The patient looked ill and appeared mentally dull; the tongue was furred. The heart and lungs were healthy, the pulse slow, 48, but regular and soft; temperature 98° F.; abdomen sunken and very "doughy" to palpation. The liver and spleen were apparently normal in size. There were no signs of otorrhœa, but on examining the scalp some swelling and œdema was noted on the occiput and posterior parietal regions; the swelling was not tender or hot, and the patient gave no history of a blow, fall, or injury.

There was no paralysis or paresis and no twitching. The pupils were equal and reacted to light and accommodation. Knee-jerks were present, but elicited with difficulty; there was no rigidity. The urine contained no sugar or albumin. A tentative diagnosis of cerebral tumour or abscess was made.

*Previous History.*—There was no history of any serious illness and he showed no signs of syphilis.

*Consequent Course.*—On the day following admission his bowels were well opened by calomel and magnesium sulphate. He still continued to vomit his food; the temperature remained subnormal, and pulse 48 to 56 per minute.

The fundus was examined and nothing definite noted, though there was a suspicion of slight blurring of the optic discs. Two deep incisions were made into the scalp behind, but no pus escaped, only a little blood.

The following morning the patient was almost comatose and could only be roused by shouting his name in his ear. There was conjugate deviation of the eyes to the right. Both arms were slightly rigid and kept close to the sides. There was no apparent paralysis; the knee-jerks could not be obtained.

Though there were no localising signs it was considered advisable to operate. The site chosen was the most "boggy" part of the scalp, which was situated over the posterior and upper part of the left parietal bone.

Considerable œdema of the loose cellular tissue beneath the aponeurosis was found, but no evidence of pus.

A portion of bone the size of a two-shilling piece was removed by the trephine, and the dura mater at once bulged into the opening. On opening the dura the vessels were found to be enormously engorged; there was practically no pulsation of the brain. Palpation showed no specially firm or soft areas, so a small trocar and cannula was inserted in a vertical direction in three different places, but only a little blood escaped.

Since there were no localising signs it was deemed inadvisable to explore further, but it was hoped that the relief of pressure might be beneficial.

The bone was replaced, the wound sutured, and a drain of some silk threads placed in the posterior angle of the wound. The patient, however, did not recover consciousness, the pulse rate increased, though the temperature remained subnormal, incontinence of urine set in and he died thirty-four hours after the operation.

*Post-mortem* examination revealed thrombosis of both lateral and the longitudinal sinuses. The thrombus in each lateral sinus, just above the sigmoid sinus, showed signs of breaking down; this was especially marked on the right side. The vessels over the posterior parts of each central hemisphere were greatly engorged.

Nothing abnormal was noted in the brain, except perhaps a slight excess of clear fluid in the lateral ventricles. The base of the brain was healthy. There were no signs of middle ear disease; both the sides were exposed. The bones of cranium were intact and healthy. The heart was healthy. The lungs showed hypostatic congestion. All the other organs were healthy, except that the liver and kidneys were slightly congested. There were no signs of any septic focus in the body or of syphilis.

*Remarks.*—Thrombosis of the lateral sinuses is extremely rare when unassociated with middle ear disease, and therefore the case seemed worthy of record. I cannot define the cause; the man was not anæmic, showed no signs of syphilis, had no heart disease, and presented no septic focus. His kidneys were apparently working normally. It seems most probable that septic infection had taken place through a scratch in the scalp, but against this view is the entire absence of pyrexia, the temperature persistently being between 97.5° and 98° F.

It is much to be regretted that cultures and smears were not taken from the disintegrating clots in the lateral sinuses.

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## THE TREATMENT OF MULTIPLE ABSCESS OF THE LIVER.

BY CAPTAIN A. J. HULL.

*Royal Army Medical Corps.*

THE method of operating upon liver abscess which has been adopted consists in draining the abscess cavity through a small puncture by aspiration, syringing out the cavity with some antiseptic solution, and supplementing this treatment by the application of negative pressure by means



of a Bier's apparatus. Originally peroxide of hydrogen was employed as an antiseptic, and later, following Major Rogers' procedure, quinine solution. It has been claimed for this method of treatment amongst other advantages that it favours the drainage of a secondary abscess, should one be present.

Whatever method of treatment is adopted, it would appear that the operation is only dealing with a local manifestation of the disease and that the cause which gives rise to the abscess may remain operative.

The practice recommended by Major Rogers of giving ipecacuanha in full doses, in addition to any operative measures, has been adopted; in some cases the treatment was supplemented by irrigating the colon with quinine solution.

The method employed for finding the abscess consists in carefully palpating the liver area before the operation and marking the skin over any relatively tender areas. Tender spots are rarely absent and can usually be discovered if the procedure is sufficiently delicately carried out. In the first instance a glass hypodermic syringe fitted with a long needle has been used and rarely has an aspirator had to be employed to find the abscess. The difficulty of the operation consists in introducing a suitable tube; a small soft one is the ideal instrument, but the difficulty of introducing one remains to be solved. The writer has had trocars and cannulæ made for the purpose, the cannulæ being of flexible metal like a Durham's tracheotomy tube, but these have been abandoned for a rigid tube. Major Rogers has invented a flexible tube, but the difficulty of introducing it through a puncture again occurs. It has not been found impossible to leave a rigid cannula in the liver cavity, and although it no doubt causes a certain amount of discomfort it has given good results. If the abscess is superficial the puncture may be dilated with fine forceps, the blades opening parallel, and a hard rubber or vulcanite tube introduced. The disadvantage of this procedure is that it requires special instruments and is by no means easy to carry out in some cases; the method employed in the case quoted below was the introduction of an ordinary trocar and cannula, the cannula being left *in situ*.

The simple operation of aspiration of the abscess cavity and injection of quinine has in many cases been so successful that further treatment may appear unnecessary; cases, however, occur which are not amenable to such treatment. Major Rogers, the pioneer of the conservative treatment of the liver, has found it necessary to invent a drainage tube, and advocates syphon drainage.

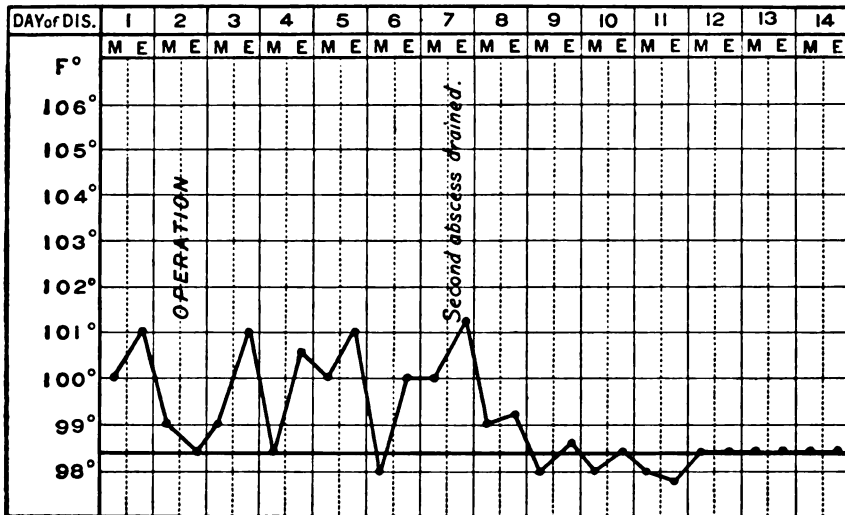
*Illustrative Case.*—Gunner G. came to hospital complaining of slight fever, loss of appetite, and pain in his right side.

The first symptoms were noticed seven days previously; he was a thin, worn-looking man, of sallow complexion, aged thirty-two years.

*Condition upon Admission to Hospital.*—The tongue was furred and

tremulous, the liver enlarged, projecting 2 inches below the costal margin; there was general tenderness over the hepatic area and the dulness extended to the upper margin of the sixth rib in the nipple line; the respiratory and circulatory systems were normal; temperature 99° F.; pulse 80; respirations 19. The patient had served for over twelve years in India; he had frequently suffered from diarrhoea, but, to his knowledge, had not had dysentery; no history of alcoholism was obtainable.

The patient's temperature rose to 101° F. in the evening and fell to 100° F. the following morning. A leucocyte count of his blood was made, with negative results. Ipecacuanha was administered in full doses daily and sodium sulphate in 2-drachm doses twice daily. An initial dose of calomel was given, and ipecacuanha combined with Dover's powder was continued daily throughout the illness.



*Operation.*—A. C. E. mixture having been administered, a glass hypodermic syringe, fitted with a long needle, was inserted at the point of maximum tenderness, an inch outside the nipple line in the seventh intercostal space, and pus was withdrawn at the first puncture. An aspirating cannula connected with an exhaust bottle was then inserted into the abscess cavity and 3 ounces of pus were drawn off.

Guided by the cannula, an attempt was made to introduce dilating forceps into the cavity, but the forceps at hand were not long enough to reach the abscess cavity easily, and no adhesions being present the vulcanite drainage-tube slid over the polished peritoneal surface of the liver and could not be introduced into it. A trocar and cannula,

2 mm. in diameter, was therefore plunged into the cavity; through the cannula the cavity was irrigated with sterilised water, and finally 20 grains of quinine bihydrochlorate were introduced into the cavity. A Bier's bottle was then applied over the puncture and the air in the bottle exhausted, the cannula being left in the wound.

On the day following the operation the Bier's glass was removed and the cannula was found to be filled with blood-clot; the end of the clot was seized with forceps and the blood-mould of the tube withdrawn entire. The cavity was then exhausted by means of a powerful syringe fitting the cannula; a few minims of pus came away. After the abscess cavity had been washed out, 20 grains of bihydrochlorate of quinine were injected, and the Bier apparatus was again applied. During the following days the patient's condition improved, but an evening rise of temperature occurred. Six days after the operation, by applying powerful aspiration to the cavity, 4 ounces of pus were withdrawn; up to this time there had been no discharge of pus from the cavity since the original operation, with the exception of a few minims on the second day. The abscess was treated in the same manner as after the first operation. Twenty-four hours later, about 2 drachms of pus were discharged into the bottle; the cavity was washed out daily with sterilised water and quinine. On the fourth day after the removal of the pus from the second abscess, the patient's temperature having been normal since the operation, the cannula was withdrawn and the puncture sealed. The patient made an uninterrupted recovery, the liver returned to its normal size, and the patient's general health rapidly improved.

#### NOTES ON THE CASE.

*Diagnosis.*—An abscess in the right lobe of liver was diagnosed in this case on the following grounds:—

Pain in the region of liver, pain in the right shoulder, and pyrexia. The patient was operated upon within twenty-four hours of his arrival in hospital. Dysenteric amœbæ were found in the liver pus. An exploratory puncture in doubtful cases cannot be too strongly advocated; there is no pathognomonic sign of liver abscess except the finding of pus. If definite signs of liver abscess are present, and the abscess is not found by aspiration, the liver should be explored through an abdominal incision.

*Operation.*—It is important to bear in mind the anatomical relations of the structures when attacking an abscess through the chest-wall. Both the pleural and the peritoneal cavities are traversed. The respiratory movements alter the relations of the layers to one another, so that if a needle is withdrawn its track cannot be followed again. It is therefore of cardinal importance, once the abscess is found, to keep an instrument in the cavity; if the first needle introduced be entirely withdrawn it cannot be replaced by another instrument unless another puncture is made with a sharp instrument. It is advisable to defer aspirating pus

until the cannula which it is proposed to leave in the wound is introduced, the large pus-filled cavity being easier to hit off than a partially contracted one. It is quite possible for a blunt instrument to glide over the peritoneal surface of the liver into the peritoneal cavity if no adhesions be present.

*Clinical Phenomena following the Operation.*—In this case, after the first removal of pus the patient's temperature was lower than before the operation, but not normal; tenderness of the liver remained. No pus was removed by irrigation during the six days following the operation. Almost immediately the second abscess burst into the cavity the symptoms were relieved and the patient's temperature fell to normal.

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#### A METHOD OF SECURING DRESSINGS WITHOUT THE USE OF BANDAGES.

By MAJOR F. J. W. PORTER, D.S.O.

*Royal Army Medical Corps.*

IN a considerable number of operations, *e.g.*, appendectomy, gastro-enterostomy, radical cure of hernia or varicocele—it is not necessary to apply pressure over the dressing. The pressure of the bandage which is usually applied to keep the dressing in position, is in many cases such a source of irksomeness and discomfort that it is useful to know of some other method.

A 20 per cent. solution of gelatine, to which 1 per cent. thymol is added, is put into large test tubes, corked with cotton-wool, and sterilised for three successive days. The operation wound is covered by a narrow strip of gauze containing forty or fifty thicknesses. Over this is placed a square of gauze of *two* thicknesses, and large enough to overlap the pad by about 4 inches in every direction. The contents of a test tube (liquefied by having been placed in hot water) are now poured into a gallipot, and 20 minims of a 4 per cent. solution of formalin stirred in. By means of a small swab held in a pair of forceps, this paint is applied to the overlapping square of gauze, care being taken not to wet the thick pad, and to keep the gauze on the stretch. About  $\frac{1}{2}$  ounce will be found sufficient to secure a dressing of ordinary size.

I used this method during the last two or three months of my stay at Colchester, and the economy in bandages was very striking.

In such a climate as Sierra Leone the gelatine is always liquid. For hot climates, some preparation with a higher melting point should be secured, which would set much more quickly than the formula I have mentioned above.

This method is not in any way original; I got it from Mr. Moynihan, of Leeds.

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## LACERATIONS OF THE PELVIC FLOOR DURING LABOUR.

BY CAPTAIN J. TOBIN.

*Royal Army Medical Corps.*

MY excuse for writing on this subject is that a medical officer may, at any time, be called upon to attend a case of labour in which there is a threatened or an actual perineal rupture. Lacerations of the perineum during labour are common, and even at the Rotunda Hospital, Dublin, in spite of the adoption of methods of saving it, 50 per cent. of primiparæ have the perineum torn to a greater or less extent, requiring stitching. It is scarcely an exaggeration to state that one-half of the gynecological cases owe their condition directly or indirectly to rupture of the pelvic floor during labour. The results of neglect in repair of ruptured perineum are many, and may be the cause of life-long invalidism. It may be the starting point in the puerperium of puerperal ulcer and sepsis; later, from want of proper support of the pelvic floor, relaxed vaginal outlet, cystocele, rectocele, prolapse, or retroversion may result.

At the Military Families' Hospital, Devonport, we have our share of perineal lacerations, and so has every other maternity hospital.

*Prevention of Ruptured Perineum.*—The most important part of the management of the second stage of labour is the prevention of perineal tears; deep tears are avoidable in normal cases. It is usual to speak of supporting the perineum when during labour there is a threatened laceration. This expression is unfortunate, as no amount of support applied to the perineum will prevent laceration unless the movements of the head are directed. The object in view is to get the occiput to clear the pubic arch and to prevent extension of the head taking place until the bi-parietal diameter is free from the vulva. This implies that the natural tendency to extension of the head must be resisted up to a certain point by making pressure on the head with the fingers of the left hand, whilst pressure is applied with right hand between the anus and the tip of the coccyx (note that the pressure is not applied over the stretched perineum), and at the same time allowing the occiput to protrude beneath the symphysis, the head being kept flexed until the wide posterior part (*i.e.*, bi-parietal diameter) has escaped. It will thus be seen that the important point is not the support given to the perineum, but the attitude of the head when escaping from the vulva.

If a laceration of the perineum appears to be inevitable, two lateral incisions may be made in the anterior edge of the perineum on each side (episiotomy). I can vouch for the practical utility of this little operation. In spite of all precautions a certain amount of laceration almost always occurs in a primipara, and even when the perineal body seems intact externally there may be considerable laceration of the lower part of the posterior vaginal wall.

*Examination of the Perineum after the Child is Born.*—It is always

advisable to examine immediately after the child is born, for the parts are least sensitive then; after taking the necessary antiseptic precautions, separate the parts, holding them well open, sponge them, and take particular care to examine the extent and depth of the tear along the posterior vaginal wall. There are three degrees of perineal lacerations described:—

*First Degree.*—Is a superficial perineo-vaginal tear. It is a tear of skin and mucous membrane, and may be regarded as an extension of the tear of the fourchette which so often occurs in first labours.

*Second Degree.*—Is a vagino-perineal laceration which is deeper than the first degree, but does not involve the sphincter ani; very commonly the vaginal portion of this tear extends along the posterior vaginal wall on one or both sides, and this internal tear may not be suspected unless the vagina is carefully examined after labour.

*Third Degree.*—Is a vagino-perineal rectal tear in which the sphincter ani is involved. Tears of this degree involving the sphincter ani and rectum extend upwards for a variable distance, and like lacerations of the second degree are prone to occur on one or both sides of the posterior vaginal wall.

*General Principles of Treatment.*—The aim must be to secure the exact approximation of denuded surfaces in their normal relative positions; all necrosed tags and bruised bits of tissue should be snipped away; it is sometimes surprising the ragged and bruised appearance that a ruptured perineum may present. The suturing of the posterior vaginal wall should be carried out so that no pockets for the retention of stagnant secretion remain.

*Suture Material.*—Silk or catgut is the best for buried sutures and silkworm-gut for external sutures, this is especially serviceable when deep sutures embracing a large amount of tissue have to be passed. I have found that catgut is absorbed too soon.

*Operation in the Third Degree.*—The ill-effects following neglect of repair in this degree are so deplorable that an immediate operation is of special importance. The edges of the rectal mucous membrane are carefully united by a series of interrupted catgut stitches which must be tied on the rectal side. Then the torn edges of the posterior vaginal wall are united in the same manner; and lastly, deep sutures of silkworm-gut are passed through the perineal surface, the lowest of which should include the divided and retracted ends of the sphincter ani muscle. Stitches should not be pulled too tight, as they cause unnecessary pain later, and are a cause of urinary retention.

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## A CASE OF LUDWIG'S ANGINA FOLLOWING MUMPS.

BY CAPTAIN T. B. CLARKE.

*Royal Army Medical Corps.*

No. 7013 Serjeant P., Depôt, Gordon Highlanders, was admitted to the Military Hospital, Aberdeen, on April 8th, 1909, suffering from mumps. He was placed in the isolation ward. Under ordinary treatment the pain and swelling of the parotids largely subsided. The patient had a bad night on the 17th, and in the morning the swelling on the right side had greatly increased, extending downwards to the clavicle and forwards to the middle line. The skin over the affected area was red and shiny, and very tense. A blood examination showed leucocytosis. The temperature ranged between 100° and 103° F. The part was shaved and boric fomentations were applied. On the 18th the patient's condition became critical, there was marked dyspnoea and dysphagia, the face was cyanosed, and the swelling became œdematous.

The medical officer in charge of the case made an incision at the upper posterior margin of the right sterno-mastoid muscle, but pus was not found. The incision relieved the patient somewhat, as when I saw him for the first time at 10.30 p.m. that day the symptoms were not urgent, so it was decided to wait until morning before undertaking any further operative measures.

Next morning deep fluctuation could be made out under the upper third of the right sterno-mastoid muscle.

Captain N. E. Harding, R.A.M.C., gave the anæsthetic (chloroform); I enlarged the original incision, and after dividing the deep cervical fascia pus was found about 1½ inches from the surface, 5 to 6 ounces being evacuated. A rubber drainage tube was introduced to the bottom and the cavity packed with gauze. The patient's temperature fell and the symptoms were much relieved.

On April 31st the patient was transferred to the Military Hospital, Edinburgh, for the benefit of the nursing. On June 1st, fluctuation was made out about 2 inches below the first incision. This was opened under ethyl chloride, and half an ounce of pus escaped. Patient made a good recovery, and proceeded on sick furlough early in July.

All the patient's teeth are quite sound, and the nasal cavities and accessory sinuses are healthy.

## MULTIPLE WOUNDS DUE TO A SINGLE BULLET.

BY LIEUTENANT W. E. C. LUNN.

*Royal Army Medical Corps.*

WHILST spending my leave in the Kurram Valley, N.W.F.P., I had the opportunity, through the kindness of Major Scott-Moncrieff, I.M.S., of seeing rather an unusual case of multiple wounds caused by a single bullet. The history was as follows:—

The patients, a native woman and her child, were peacefully sleeping inside their hut, the child being at the mother's left breast. A neighbour who had a grievance against her stole into the room and fired a Martini rifle, wounding both her and the child. He immediately made good his escape. Both woman and child were brought into the native hospital at Parachinar three days later, when I saw them.

All the wounds had been dressed, as is customary in the Kurram, with fresh goatskin, a very septic and foul-smelling dressing indeed. The child was semi-moribund with tetanus, literally resting on head and heels during the spasms.

The course of the bullet, as far as was ascertainable, had been as follows:—

*Number of Wounds.*—(1) The child's left forefinger; (2) and (3) the child's right forefinger and thumb; (4) the child's chin; (5) and (6) entrance and exit wounds through the mother's left breast; (7) the child's left eyebrow and underlying frontal bone blown away; (8) the mother's left forefinger lacerated; (9) and (10) the entrance and exit wounds through the mother's left arm, posterior to the humerus and opposite the insertion of the coraco-brachialis. A total of ten separate and distinct wounds.

The child died the following day, but the mother made a quick recovery.

I should be interested to hear if any reader of the Journal had met with a case where more wounds were caused by a single bullet.

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### SUICIDE IN A FIT OF TEMPORARY INSANITY.

BY CAPTAIN C. D. MYLES.

*Royal Army Medical Corps.*

ON June 28th, 1909, when in camp at the Curragh with the 2nd Battalion Essex Regiment, I was called out to see a man who had committed suicide in a fit of temporary insanity. There were two points of interest which I should like to bring to notice and which I am sure will prove instructive.

The first is the explosive effect of the modern Service rifle at very close range.

The deceased committed the act by placing the muzzle of his own Service rifle, which was loaded with ball ammunition, close to his right mastoid region and fired it by pressing the trigger with his finger. This is quite possible with the new short rifle, and of course brought the muzzle close to his head.

The entrance wound situated in the right mastoid region was about  $\frac{1}{4}$  inch in diameter, being burnt and punched out, with inverted edges.



The exit wound was represented by the floor of his cranium, the details being as follows: The scalp was split into two flaps, the larger being attached to the right side of the head. The whole cranial vault was blown away a little above Reid's base line and was scattered around the tent in pieces of various sizes, which were stripped of dura mater and in some cases a portion of the periosteum was raised.

On the floor about 1 yard behind where he must have been standing lay both cerebral hemispheres in their membranes apparently intact, having been enucleated *en masse* from the cranium. There were several radiating fractures of the base of the skull. The face bones were intact, and there was no sign of injury to the face.

He did the act in a tent, and just above where he stood there was one large hole, 1 inch by  $\frac{1}{2}$  inch, evidently where the bullet went out, and ten small holes like what would be caused by No. 4 shot, made no doubt by several small pieces of the cranial vault being driven through the tent, showing how small portions of bone may be turned into projectiles capable of doing damage by the impact of the bullet at close quarters.

The second point of interest is the motive for doing such a thing. The deceased was a good soldier and was thought a lot of by his company officer, to whom he was talking a few minutes before, and at the time he seemed quite well.

There was one subject on which he used constantly to dwell in a morose fashion—viz., syphilis—and after one lecture during the winter session he said that if ever he got it he would commit suicide rather than face the possibilities of such a disease. He also left a letter warning young soldiers about going with women of a certain class. I might add that there were no signs of syphilis on the deceased.

There does not seem any doubt that the deceased was a syphilophobe, and it points out that one should bear this in mind when lecturing on syphilis to soldiers, so that if one paints the picture darkly one should show the silver lining of good treatment as well.

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## THE ADVANTAGES OF NATIONAL MILITARY TRAINING.

BY SERJEANT-MAJOR C. W. KINSELLA.

*Royal Army Medical Corps.*

In considering this subject, I propose to deal with the advantages accruing to: (1) The individual; (2) the State.

(1) To the first named, more especially if adopted in youth, the training can give nothing but beneficial results, morally by teaching self-reliance, stability of character, the meaning of patriotism in its highest sense, and every quality which tends towards manliness. It also teaches the lessons of obedience, self-restraint, and honour, while the emulation which exists among youths undergoing such training is productive of a rivalry which can have only the best results.

Physically, the open-air exercises are productive of nothing but benefit to the individual, improving his general physique, eliminating deterioration due to preventible causes, rendering him hardy and more immune from fatigue, and by the hygienic conditions so existing rendering him less susceptible to contract disease. Such an individual becomes a reliable citizen of the Empire, and when, in the fulness of time, he becomes a Benedict, his children, raised in the same tenets, play their part, however small, in forming the ideas of their (new) generation. One needs no further proof of the above assertions than a comparison between the healthy, happy-minded inmates of the Royal Duke of York's School (or its kindred institutions) and the children of those who, alas! cannot obtain similar advantages.

The training of the one carries him on, in nearly every case, successfully, until he departs for "that bourne from which no traveller returns"; to the second, heavily handicapped, life means one continual struggle.

(2) To the State the military-trained citizen is an invaluable asset. Presuming he is not destined for the Services, he has learnt the virtue of patience under difficulties, punctuality, &c., and assimilated, perhaps unconsciously, loyalty to his employer—all useful assets in commercial life.

Again, supposing him to have been educated in an institution which boasts of a cadet corps or similar organisation, he has probably learned to take some interest in rifle shooting, which he still, where possible, follows during his leisure hours, until he becomes no mean shot. Consider the advantage to a State of having a body of citizens, who with a little organisation are not only willing to defend their hearths and homes, but competent to do it, as compared with an untrained and undisciplined mass.

Having briefly enumerated the resulting advantages, let us consider the *status quo* in relation to their attainment.

Drills and similar exercises are practised in most schools, in some no doubt with much benefit; but one would like to see introduced some universal system by which a regular progressive syllabus could be carried out: efforts to this end, indeed, are now engaging the attention of the Canadian and Australian Legislatures. Cadet corps and similar bodies should be more warmly encouraged, and the youth on leaving the same to face the battle of life should be taken in hand, and his military ardour encouraged in his new sphere, so fructifying the seed which has already been sown, a task which might indeed be allotted to the local associations in course of formation under the Bill of the Secretary of State for War.

This subject is indissolubly connected with its kindred topic, "National Defence," and if we accept the late Lord Salisbury's dictum that "the defence of a country is not the business of the Government, or of the War Office, but of the people," to the people one must look for support.

Conscription, or indeed compulsory training in any form, is unaccept-

able to the people of Great Britain, so we must look to voluntary enthusiasm to contribute the necessary quota.

As Switzerland has latterly been much in evidence, one may be pardoned for digressing to consider that country's procedure.

At 10 years of age, the schoolboy drills and plays at soldiers in his playground, assimilating rudimentary ideas; at the age of 20, he gives forty-five days' training in his first year, and sixteen days per annum for the next eleven years; then at 32 he becomes one of the First Reserve, where nine days in every four years only are required, and at the age of 42 he passes to the Second Reserve, and is not interfered with unless war should arise. Without claiming that this system is suitable for England, or that it produces highly trained soldiers, it behoves us to consider if some portion of the Britisher's annual holiday, and of the time spent in cricket, football, &c., might not be allotted to military training as a sport or pastime. Once the initial training stage is passed (as proposed in youth), a few days per annum are enough for the educated man to keep his knowledge sufficient to turn it to account in a tight corner.

From the insular position of Great Britain, she must necessarily depend upon the permanent forces, but without sharing either the pessimistic views of that party which continually preaches the invasion "bogey," or the self-complacent attitude of the upholders of the "Blue Water" school, there can be no harm in having a reserve of useful material to fall back on, should such become necessary.

It cannot be forgotten that towards the end of the South African War untrained citizens were sent to Lord Roberts' assistance, at considerable expense to the nation and to the disappointment of their commanders.

The scheme bristles with difficulties, it requires the whole-hearted enthusiasm of the nation, fostered by careful legislation, and although it would probably meet with opposition from trades unions and similar bodies, it is not likely they could withstand the pressure of local opinion.

The artisan, clerk, shop-hand, &c., all have hours of relaxation—why should not some of it be given to the sport of military training? That the enthusiasm of the younger generation can be roused, the accounts of the Boys' Bisley and the Army school teams at the Aldershot rifle meeting are sufficient proof.

The present Secretary of State for War has brought these facts home to the country, and much good work also is being done by the National Service League and kindred associations, but much and arduous endeavour still remains.

Should the day of trouble (which most people consider inevitable) arise for the British Empire, let us hope that the nation will not be found in the position of "being too selfish to secure its own interests, and so fully deserve to lose them all."

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A NEW PORTABLE MOSQUITO NET SUPPORT.

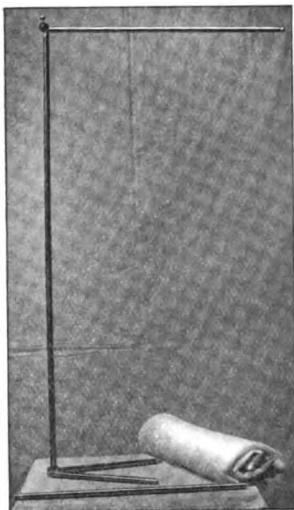


FIG. 1.



FIG. 2.

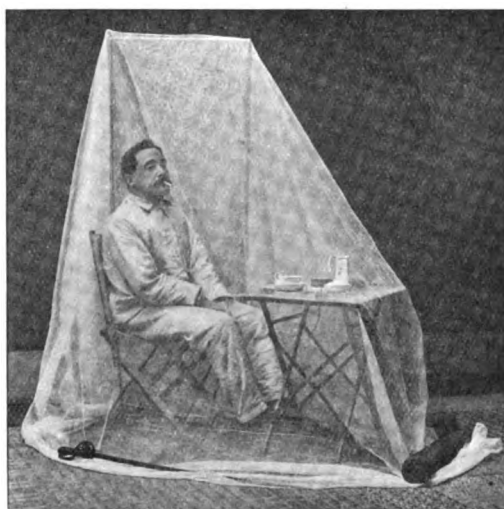


FIG. 3.

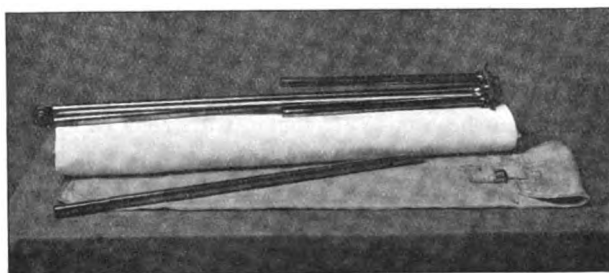


FIG. 4.

## A NEW PORTABLE MOSQUITO NET SUPPORT.

BY LIEUTENANT-COLONEL C. E. NICHOL, D.S.O.

*Royal Army Medical Corps.*

I SHOULD like to bring to the notice of officers serving abroad a portable mosquito net support which has just been invented and patented by a lady who has resided for a considerable time in the Tropics, and which is a great advance on anything of the kind I have yet come across. The accompanying diagrams explain the device.

Fig. 1 shows the support erected ready for fixing on a bed, together with the mosquito net and extension rod for adapting to a chair and a table.

Fig. 2 shows the support erected on a camp bed, with net suspended over sleeper, also the carrying valise and extension rod.

Fig. 3 shows the support (with extension rod) erected over a chair and table.

Fig. 4 illustrates the compactness of the apparatus, showing the netting, support, extension rod and valise, the whole weighing about 4 lb. and measuring less than 30 inches.

The price is £2 2s. and it can be obtained, without net if required, from "Corries Patent, 25, Great Winchester Street, London, E.C."

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## Lecture.

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PARATYPHOID FEVER IN MALTA.<sup>1</sup>

BY SURGEON-CAPTAIN ROBERT SAMUT.

*1st King's Own Malta Regiment (Militia).*

IN presenting to the medical profession an account of that type of infectious disease which latterly has figured so largely both at the hospital and in our private practice, namely, paratyphoid fever, and in detailing the circumstances connected with the origin and progress of this disease, which in its course has already claimed victims, I have implicitly adhered to clinical facts collected from my own cases and from those of other practitioners, and to the careful study of the micro-organisms connected with the disease at the Pathological Laboratory of the Central Hospital.

As to the object of this paper, it is scientific inasmuch as it is intended to bring before you those facts connected with this group of bacilli which are conspicuous by their absence from the ordinary text-books; to demonstrate these facts by means of bacteriological preparations which, in most

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<sup>1</sup> Lecture delivered in the University Hall on July 16th, 1909.

cases, will speak for themselves; and to show that the clinical picture of paratyphoid may so closely resemble that of Mediterranean fever as to be identical with it in some cases. I cannot help feeling that many cases in which the diagnosis was not based on the Widal test have gone to swell that dark list of our statistical returns, the list of Malta fever, which would otherwise have been classified under their proper heading, namely, that of paratyphoid fever. Finally, our considerations on the infectivity of the disease, and of the ways and means by which the infecting bacilli are spread, cannot help leading us to a few practical conclusions with regard to prophylaxis, which might spell "prevention is better than cure."

The word paratyphoid was first adopted by Achard and Bensaude in 1896<sup>1</sup> to differentiate those cases of typhoid fever which, being typical of this disease in respect to their symptomatology, presented such constant anomalies to the Grüber-Widal test as to be classified under a special heading. Once recognised, the typhoid anomaly was described under the name of paratyphoid or paracolon fever by Widal and Nobecourt, and later by Gwyn, Brill, Mournier and Cushing.

In 1901 Schotmüller determined definitely the nature of a bacillus which he succeeded in recovering from the blood of a patient who was suffering from fever, clinically identical with enteric fever, but whose blood did not yield the Grüber-Widal reaction with the Eberth bacillus.

Burch, Brion, Kayser, Kurth, Johnston, Hume and others have subsequently added considerably to our knowledge of the disease, while the bacteriology of the group has been enriched in no small measure by the researches of Colonels Birt and Firth, and Majors Statham and McNaught, R.A.M.C.

Unlike true typhoid fever which owns for its origin infection by one and only one micro-organism, the bacillus of Eberth and Gaffky, paratyphoid is a group disease for which a number of organisms are responsible, the chief varieties being:—

*Bacillus paratyphosus* A.

*Bacillus paratyphosus* B.

*Bacillus coli communis*.

Subvarieties of the Para. B group exist, however, which owe their names either to their discoverer or to the place where epidemics of the disease have been known: thus Gaertner, Moorceilli, Günther, Rumfleth, Brugge, Gent, Hanstadt, Aertyck, Calmphont and Meirelbeck, are examples of names to which others are being added daily. These forms differ slightly in detail, but may be looked upon as members of the Para. B family.

Yet other forms exist which produce typhoid symptoms and which therefore belong strictly to the paratyphoid group of micro-organisms, these being:—

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<sup>1</sup> Société Med. des Hopiteaux, Paris, 1896.

*Bacillus fecalis alcaligenes.*

*Bacillus mortificans bovis.*

*Bacillus typhi murium.*

*Bacillus psittacosis.*

Taking the characters common to all the members of this large group of organisms we find that they are as closely allied bacteriologically as they are clinically. They are all short, mobile rods, which do not liquefy gelatine and do not retain Gram's stain. They grow on media usually unfavourable for the growth of other organisms, and have the power of fermenting sugars and some alcohols. That their action is not limited solely to the production of typhoid symptoms, and that they may give rise to inflammation with or without the production of pus, has been definitely proved; thus hepatitis, nephritis, adenitis, cerebral abscess, and suppurative tonsillitis, have all been produced by them.

Of the media usually employed for their isolation I will do no more than mention their names, their preparation being a long and tedious process. Conradi-Drigalski, Endo, Proskauer-Copaldi, and McConkey's bile salt agar, are the principal of those media which inhibit the growth of saprophytes, but favour at the same time the growth of the paratyphoid bacilli. Others, like Gaehtgen's caffeine, Klein's malachite green, Conradi's picric acid and Fawcett's modification of the latter are still more selective, since they favour the growth of one or more forms to the exclusion of all others. Sanatogen media are also useful.

We now come to the all important action of these bacilli on sugars. Advantage is taken of their property of fermenting sugars not only to distinguish them from other organisms, but also to classify the various species of the group; since in this, more than in any other respect, the members of the paratyphoid family differ somewhat. Glucose, lactose, and maltose are the chief sugars employed, while mannite and dulcitol, which are alcohols and not sugars, serve as further means of diagnosis. Now, whereas *B. typhosus* fails to produce gas in each and all of these sugars, the paratyphoid bacilli A and B stand out in their character of producing gas in one sugar, a monosaccharide, viz., glucose. *B. coli communis*, on the other hand, ferments not only glucose, but also lactose, maltose, mannite and dulcitol, producing gas in each case.

The production of acid in these media, the action on litmus milk and on glucose neutral-red and the formation of indol, are other points extremely important in diagnosis, and I would ask you to look carefully at the specimens, which require no further description.

One word with reference to the test on which the diagnosis of cases is principally based is indispensable. We must distinguish between the words "group" and "specific" agglutination. All members of the paratyphoid group are agglutinated by sera of animals suffering from or immunised against diseases produced by them; for this to take place, however, a low dilution is essential; this constitutes "group" agglutina-

tion. "Specific" agglutination, on the other hand, consists of clumping of one form of bacillus by the serum of an animal suffering from or immunised against the disease produced by that bacillus, in dilutions considerably higher than those producing the group agglutination.

And now I will ask you to note the chief characteristics of the different members of this interesting group of bacteria, and to begin with the *B. paratyphosus* A. We find that infection with this organism is rare in man. The bacillus is possibly a South African variety, and has rarely been isolated from the blood of patients. Major Statham has been fortunate in isolating the micro-organism from the blood of four patients, and Lieutenant-Colonel Birt from that of two more. It is not so mobile as the *B. typhosus*, having but two flagella at each extremity.

*B. paratyphosus* B may be looked upon as a name indicative of a number of bacilli rather than one specialised form. The species includes the meat-poisoning bacteria<sup>1</sup> and of these some deserve closer observation. Thus Gaertner's *B. enteritidis* is responsible for most of those typhoid-like epidemics which follow the eating of unsound meat. Such cases were usually put down to poisoning by chemical substances produced by putrefaction, and passed under the heading of meat or ptomaine poisoning. Closer investigation, however, revealed the presence of a bacillus which has all the group characters of the paratyphoid bacilli. Loeffler's *B. typhi murium*, Smith's *B. cholerae suis*, *B. psittacosis*, and *B. gwyn*, are other prominent members of the group, while others have been described by Durham, Bowes, Boseman, Fisher, Cotta, Delepine, and others.

We now come to the *B. coli communis*, or the bacillus of Eserich, the commonest type of the intestinal flora, of which five varieties at least are known to exist. It is present in the intestine shortly after birth. It is less mobile than the other paratyphoid bacilli, showing, as a rule, a rotatory slow movement, though very active forms have been described.

I would merely mention the *B. faecalis alcaligenes* for the sake of completing the bacteriology, and because it is an interesting entity, since Doeberl considers that by successive passages in guinea-pigs it is possible to convert it into the *B. typhosus*, a conclusion which remains to be definitely proved. McNaught's bacillus isolated in 1907 closely resembles *B. faecalis alcaligenes* producing no clotting in milk, but marked alkalinity in less than four days.

So much for the bacteriological study of this important and interesting family of bacilli. The different strains which I have worked with, and which I now show you, have been derived from the following sources. One strain was presented to me by Major D. Lawson, R.A.M.C., another was obtained from Naples University, while two strains of *B. paratyphosus* B were isolated by me at the central hospital from the blood of

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<sup>1</sup> Durham, *British Medical Journal*, 1898-99.



patients suffering from paratyphoid fever by Castellani's method in one case, and by Kayser and Conradi's ox-bile method in the other. The cultures are all pure and respond typically to each of the tests already enumerated.

I must refrain from going deeper into bacteriology, as most of you here are not specialists in this subject, and I do not wish to overtax your attention further. I will, therefore, take up the symptoms of paratyphoid fevers without further delay.

The symptoms of this disease have a wide range, and might for convenience be classified under four types :—

(1) In the mildest form the patient may pass through the disease with no more than a feeling of indisposition for a few days with symptoms of gastric derangement and malaise. Constipation is often well pronounced.

(2) The second type is that which reproduces the clinical picture of enteric fever. In this form of the disease we generally meet with the usual premonitory signs, malaise, depression, headache, and, above all, loss of appetite and even nausea, the tongue being usually white and glossy. The patient may go about and struggle to do his work, but soon he feels too weak and realizes that he is seriously ill. A high temperature develops which runs an enteric-like course. Rose spots make their appearance on the abdomen. Diarrhoea may be present, but constipation seems commoner. Enlargement of the spleen and sometimes of the liver with jaundice are met with. Epistaxis is extremely common. The urine is highly concentrated with an increase of urea and uric acid, but a diminution of sodium chloride; albumin may be present and a positive diazo reaction is not unusual. Complications are not so common in paratyphoid as compared with true enteric, yet hæmorrhage from the bowel is, according to Klemperer, met with in 3 per cent. of cases; pulmonary complications such as congestion and pneumonia are among the commonest.

(3) The next form is one which is characterized by those symptoms usually met with in Malta fever. Now, while the close resemblance between paratyphoid fever and true enterica is firmly established, it is not usually accepted that paratyphoid may simulate Malta fever so closely as to be identical with it in all its clinical manifestations. Yet many cases have come to my notice, and during the present epidemic of the disease in Malta a large number have been returned to hospital in which symptomatology was as far removed from the usual picture of infections by the paratyphoid group as it was closely related to that of Malta fever and which on careful bacteriological examination yielded undeniable proof of paratyphoid infection. I attach particular interest to these cases.

(4) The last form is paratyphoid fever as a complicating infection during the course of other fevers, notably Malta fever. That such a

mixed infection exists was proved by me in the September number of the JOURNAL OF THE ROYAL ARMY MEDICAL CORPS, and by other cases since. What I consider most conclusive, however, is the fact that some years ago, before the paratyphoid bacilli were well understood and cultivated, hæmorrhage from the bowel had been met with in several cases of Mediterranean fever in which the blood had given absolutely negative results to the Grüber-Widal test with *B. typhosus*. Hence ulceration of the intestine was considered to be one of the complications of Mediterranean fever, while the fact was apparently proved beyond doubt in the *post-mortem* room, when the ulcerated Peyer's patches were held up for demonstration as proof conclusive of the destructive changes of the bowel brought about by the *Micrococcus melitensis*. Bruce describes such a case in the *Practitioner* of April, 1888. Bousfield's case,<sup>1</sup> reported under the title of "A Case of Malta Fever with Ulceration of the Small Intestine," is so important in this connection, and presents points which coincide so accurately with the changes witnessed by me, and no doubt by others performing *post-mortem* examinations on similar cases, that I must ask to be pardoned if I summarise them in a few brief notes:—

Bousfield states that several cases had come under his observation having more or less profuse hæmorrhage from the bowel, cases which were clinically *not* typhoid, whose sera did not react to enteric, though they did to Malta fever. One case whose blood had given undoubted reaction to the *M. melitensis*, but failed to react to *B. typhosus*, was examined *post mortem*; "eight definite ulcers situated between 18 and 36 inches from the ileo-cæcal valve were observed. Some appeared to correspond to Peyer's patches, others to the distribution of the blood-vessels. Their edges were sinuous and shelving. There was no sign of lymph deposit or of tubercles." The ulcers presented characters so much like those seen in enteric fever that Bousfield concludes by saying that "he believes the most skilful pathologist would have been unable to state that they were not those of typhoid fever." In conclusion, I may say that in our experience in the *post-mortem* room such ulcerations have never been found in cases of pure Malta fever, while their constant occurrence in cases of mixed infection with the paratyphoid bacilli is, in my opinion, very significant.

Such are the facts connected with this important group of micro-organisms. In the light of our present knowledge it becomes a duty, which falls upon each and all of us equally, to endeavour to combat by means of prophylactic measures, outside and inside the sick-room, a disease which threatens to take root among us. Such a campaign should be conducted on a thoroughly organised system which should, in my opinion, include the following considerations:—

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<sup>1</sup> JOURNAL OF THE ROYAL ARMY MEDICAL CORPS, vol. vii., August, 1906.

(1) The proper disposal of fæcal material removed from cesspits under the supervision of sanitary inspectors. Such material, diluted with water, is obviously a source of extreme danger when used to water vegetables.

(2) The emptying of wells which may have become contaminated with sewage, and which are used for watering vegetables, &c.

(3) The examination of all suspicious fevers by the Grüber-Widal test.

(4) The system of reporting all cases of paratyphoid fevers to the sanitary authorities, leading to investigation of the proximate cause of the disease.

(5) The isolation of cases so far as it may be possible.

Much can be done by the medical attendant, who should not be content with only warning members of the household of the danger of contact with the patient's excreta. He should invariably see that a basin containing disinfectant, such as lysol or cresol or any other favourite antiseptic, is provided, and give the necessary instructions for its use.

(6) Lastly, I would point out the all-important question of the "bacillenträgers," or "carriers." These should be warned of the danger they are to others by being centres of infection. By voiding bacteria in all their virulence, in their urine and fæces, they are the means of disseminating disease, and no pains should therefore be spared in instructing them in the measures to be adopted to minimise the danger of those who are nearest and dearest to them.

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## Travel.

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### TOSARI: THE HILL SANATORIUM OF THE NETHERLANDS INDIA.

BY CAPTAIN MAYNARD CRAWFORD.

*Royal Army Medical Corps.*

WITHIN a moderate distance of Singapore there are only two places available which have "cold climates" and at which invalids can obtain a complete change from the damp heat of the Straits. They are Newara-Eliya in Ceylon, and Tosari in Java, the latter being the nearer and also the less known.

The following notes of a visit to Tosari may interest readers of the Journal, especially those stationed in the Straits Settlements.

Tosari, which has been described in the *Straits Times* as the Mussoorie of the Netherlands India, is a sanatorium placed on the north-west spurs of the Tengger Mountain in East Java. It can be reached in four days and a half, the last two of which must be

spent in travelling either by rail or sea, from Batavia in the western to Sourabaya in the eastern end of the island. Dutch, French, and Chinese boats connect Batavia with Singapore. The voyage is usually perfectly calm.

If the cross Java rail route be taken one lands at Tandjong Priok and entrains for Batavia, distant about 10 miles. Agents of all the hotels meet the train and boats and take charge of luggage.

From the station to the hotel the road lies along quaint streets beside a typical Dutch canal. The conveyances are "mylords" and "sadoes."<sup>1</sup> The first is a two-pony victoria driven by a Javanese in a conical hat; the second is not unlike a British Indian Bareilly cart. As might be expected from the name, the "mylord" costs more to hire than the "sadoe." (Hotels, Des Indes and Wisse.)

In Java trains do not run at night; an early start is therefore the rule. From Batavia to Sourabaya takes two days, or three, if the prettier route through the mountains *via* Buitenzorg and Bandoeng be selected. If an extra day can possibly be spent on the journey, this is the better way.

The finest Botanical Gardens in the world are at Buitenzorg, where they surround the palace of the Governor-General. In them also lies the grave of Lady Stamford Raffles, kept in order by the Dutch Government under a special clause in the treaty by which England ceded Java to Holland.

Eastern Java is much flatter and mostly laid out under sugar-cane plantations; *en route* the platforms at Djocjakarta and Soerakarta are worth looking at, for these places are native regencies, and the costumes seen there are often very fine.

Second-class travelling is very comfortable and quite possible, the conditions being different to those in British India. The check system is in vogue for van luggage, and a considerable amount is allowed free in the carriage, although not so much as in British India. There are dining cars on the through trains.

The station-masters (station-chef) all speak English and are easily found, as they wear a red-topped cap. Etiquette requires a bow to be made to passengers already seated in the carriage.

The Dutch language is so like what may be called rudimentary English that it is possible to use the Dutch railway guide with fair ease. The word "*doorgaande treinen*" (through-going trains) is an example of my meaning. Of the two trips the sea journey

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<sup>1</sup> Sadoe = *dos*; *dos* = back to back.

#### 450 *Tosari: The Hill Sanatorium of the Netherlands India*

is the most comfortable for an invalid and also the cleanest. There are many interesting places along the line, but space prevents digression.

From Sourabaya (Hotels, Simpang and Embong-Malang) the journey can easily be done in half a day: the route given in the Sanatorium prospectus is as follows:—

“One leaves Sourabaya (Goebeng Station) at 6.42 t.m.<sup>1</sup> and arrives at Pasoeroean 8.20 t.m. Here the agent of the Sanatorium is on the platform and helps (gratis) to continue by carriage the trip to Poespo (2,600 feet in two and a half hours), changing carriage at Passerpan half-way (costs f. 5.50). At Poespo (very nice sub-tropical climate) tiffin is served.

“After tiffin one goes by pony (with well-fitting European saddle for lady or gentleman) or sedan-chair to Tosari (6,000 feet). This main road leads through a beautiful tropical landscape.”

From the station at Pasoeroean the road leads first through irrigated rice-fields alternated with villages (kampongs) and groves of cocoanut or bamboo. At Passerpan the ascent of the outlying spurs commences and the scenery at once becomes more European. The road is well graded and the ponies are sturdy and well fed, altogether more pleasant to drive behind than the ponies on the Kashmir-Murree road. They are smaller and more like the Burmese type of animal.

The road winds about a good deal on the hill-sides, and as the hedges are high there is a lot of hornblowing at the corners. I saw fourteen varieties of butterflies on this part of the road.

At Poespo, 2,600 feet up, the driving part of the journey ends. Here some difficulty may be experienced in getting luncheon, as the proprietress does not speak English. The hotel is, however, under the same management as the Sanatorium higher up, and bills can be paid at this latter place. The easiest way is to telephone to Tosari, from which place the order for tiffin will be translated back to Poespo. The climate of Poespo is like that of the South of France, and it is usual to sit out in the open air after dinner, for Tosari itself is rather cold. Visitors sometimes stay at Poespo for a while to acclimatise, but it must not be forgotten that there are no amusements here and that it is a very tiny place. The road onwards to Tosari is steeper, but still broad and smooth.

The forest thins out until the scenery consists of bare spurs

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<sup>1</sup> Te morgen = a.m.

and ravines covered with fields, in which European vegetables and maize are grown. Some of the fields and the edges of the roads are bordered with a single row of Tjemara trees (*Casuarina*) planted by the Forest Department. Over the centre of the road is suspended the telephone wire to Tosari. The scarcity of trees and the fact that almost all the ravines radiate downwards from the central crater, render the Tengger landscape somewhat unlike that of Himalayan Hill stations, but it has a bald attractiveness of its own, to which, of course, the tropical colouring adds considerably. Tosari lies on the north-west slopes of the Tengger Mountain, about 45 miles distant from Sourabaya and 6,000 feet above sea-level. It consists of the Sanatorium, or Hotel Tosari, with a branch building a few hundred feet up the hill and a small Tenggerese village close by. Higher up still is the Hotel Ngadimono, nearer the crater and in a more lonely situation; it is a less cosmopolitan hotel. The village has no shop or post office.

The Tengger Mountain is a huge solitary mass rising from the plain all round to a circular crater, which has a diameter of about 3 miles. Tosari is the highest Sanatorium in the Netherlands India, and has an exceptionally dry climate, due in all probability to the deafforestation of the Tengger and the lessened rainfall caused thereby, and also to the fact that the climate of Eastern Java is somewhat dry. The temperature averages 74° F. In June and July the nights are at their coldest, the driest time being March 15th to December 15th. The mountain-top is often covered with clouds after 11 a.m., but they do not seem to be very damp even when dense. I was informed that moulds did not grow on boots or other clothing; certainly I found none after a week's stay.

Many old Dutch-Indian residents say that Tosari is too cold and that they prefer places like Garoet or Sindanlaja (3,480 feet) in the western part of the island, which are not so elevated. Garoet, during my visit in May, had a lovely climate—warm in the daytime and cool at night; not, however, so cold that it was necessary to sit indoors; in short, much like that of Mentone in winter. In May, Garoet is very full and rooms are hard to obtain, the school holidays falling about May 15th to June 15th.

Bandoeng (2,500 feet) and Soekaboemi (2,100 feet) are probably more suitable in May and June than Tosari for severe cases of illness coming from hot, damp places like Singapore and Saigon.

Sindanlaja is a small village high above Soekaboemi and has a good name for its climate. The larger places have good libraries, and Bandoeng has a fine club. *In fact, so excellent a climate can be*

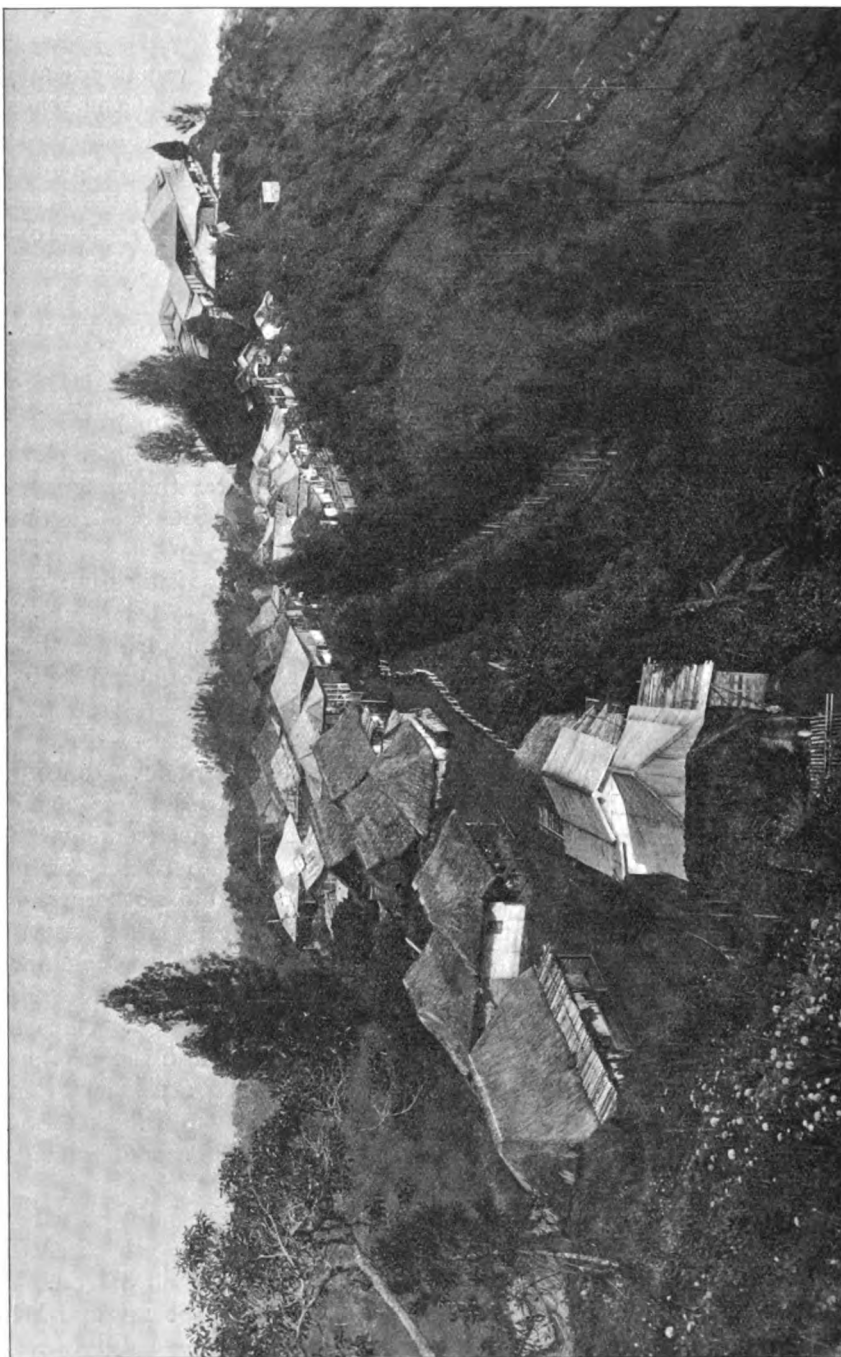


FIG. 1.—Tosari Village (upper branch Hotel to right).

had at these inland places, and at such low elevations, that great military hospitals are placed at Tjimahi<sup>1</sup> (Bandoeng), West Java, and Malang,<sup>2</sup> in East Java. To these places all the severe cases from the out-lying islands and stations are sent to convalesce. Except Tosari there is no *very* elevated sanatorium in Java.

There is no malarial fever amongst the Tenggerese villages. A few mosquitoes are to be found, but no Anopheles, and Koch was unable to find any during his visit. There was no need for the net supplied in the hotel, which was made of a thin material without pretence at being a net. In fact, these curtains were probably intended to act as the old four-poster bedsteads did, and keep the sleeper warm.

The Sanatorium has about 100 rooms in all, thirty-four being rooms in six detached pavilions, forming the Hotel proper, and thirty-two rooms in five pavilions in old Tosari (a branch a little way up the hillside). This latter point is to be noted, as, except in November and December (the season), all meals are cooked in the lower hotel and sent up. Rooms are of various sizes, arranged mainly *en pavilion*, these being the best and having a useful verandah. Such rooms are usually given to the longest-staying visitors. The bedrooms have no fireplaces, the bed-linen and blankets are well cared for; a travelling-rug is useful. As in Continental hotels, no soap is given. A special dining-room is provided for children. Some of them were galloping about on rough ponies, and they looked, as far as appearance went, quite as healthy as English children.

The Director, who is a qualified doctor, and the Manageress, speak English fluently. Amongst the "boys" (waiters) few knew any English. Visitors, therefore, who do not know Malay should provide themselves with Kelly and Walshes' "Hand-Book of the Malay language." It is a tiny book for the vest pocket and is most useful, Javanese Malay being almost the same as that spoken at Singapore. It can be obtained at Kelly and Walshes' shop in Singapore.

The Hotel has its own dairy, butchery, and piped water supply. The water does not need boiling. Milk is abundant and good. Food is European in type and excellent; it is more English than in many of the hotels. Tinned goods are imported direct from Holland. Vegetables are plentiful, as their growth is one of the staple industries of the Tenggerese native. Strawberries are in

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<sup>1</sup> Pronounced Cheemahee.

<sup>2</sup> 1,446 feet, o.s.



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season from August to October ; peaches from June to October, and mangosteens from December to February. Terrong-blanda and citrons can be had all the year round. The former is an apple-like fruit with a brown pulpy interior.

Sanitation is on the European system and water-borne. There are several bath-rooms of Dutch-Indian pattern, *i.e.*, no bath proper, bathing being carried out by pouring water over oneself from a small pannikin.

The hotel messenger brings the post every evening, and articles can be obtained from Sourabaya, or Batavia, per *remboursement* (the British-Indian V.P.P.). A private telephone joins Tosari to Pasoeroean *via* Poespo, and from thence messages are wired to Sourabaya.

To convey invalids up to the Sanatorium, on notice beforehand, a special four-horse carriage with lying-down accommodation can be had from Pasoeroean to Poespo, and litters for the journey thence up the hill. Chairs can be had for those who do not wish to ride. Nurses can be obtained from Sourabaya in a few hours, and consultations arranged for by wire.

The view from the hotel terrace is a splendid one, extending to the sea over the mountain slopes. For amusements there are two cement tennis grounds, one at the upper branch, a skittle alley, and a billiard table (cannons).

There is a moderate library, chiefly of Dutch and German books. A badminton court could easily be arranged for. There are some almost level walks in the vicinity of the hotel, and occasionally a band comes up and plays dance music. Cards and music are the general evening amusements. There is a "dark room." Pony hire is fairly moderate and the ponies are good.

The great attraction, however, of Tosari, apart from its climate, is the trip to the active crater of the Bromo. This is described in a Dutch-printed handbook as one of the *remarkablenesses* of Java ! To visit the crater a start is made about 5.30 a.m. by pony or chair to the Moengal Pass. This is the lowest place in the crater wall nearest to Tosari, and can be reached in about two hours ; it is merely a depression in the crater rim. The early start is necessary, as clouds sometimes cover the crater a few hours after sunrise. Up to the pass the road is bare, with only a few Tjemara trees amid vast slopes covered with vegetables. At dawn the colouring is superb and the view magnificent. Before one lies an enormous crater of horse-shoe shape, bounded by precipitous walls of 1,000 to 2,000 feet high, except the wall joining the points of the horse-

shoe, which is only 300 to 500 feet high and as level as an artificial dyke (not shown in figure; 1,000 feet below, at the foot of the precipice, extends a smooth, yellowish plain of sand measuring about three miles across—the celebrated “Zand Zee.”

In the centre of this rise four craters, of which the nearest is the extinct Batok, a perfect cone, 600 feet high, with green ribbed sides and level top; partially hidden behind this is the much lower and open funnel of the Bromo, a brown mud-and-rock cone; behind this again a confused mass of the two others, now extinct. From the Bromo issues a dense cloud of smoke and steam and a

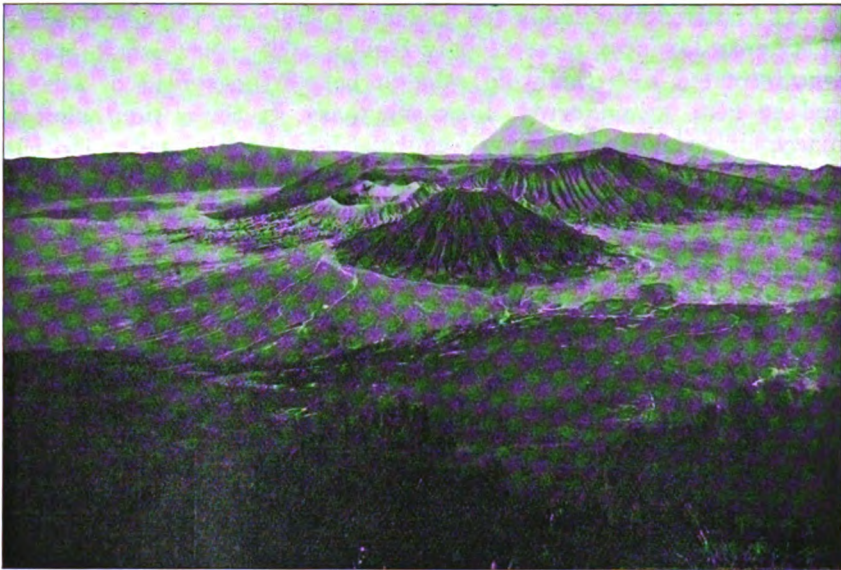


FIG. 2.—View of Bromo Crater and Zand Zee (showing Smeroe).

continuous roaring, which is plainly heard on the Pass two miles away. To each side of the view are the high end-points of the horse-shoe walls, and away over the low connecting ridge is seen the smoking cone of the Lamongan and the lower slopes of the Tengger. To the south over the intervening hills rises the bare summit of the Smeroe, the highest active volcano in Java, from which at intervals a dense smoke-ball shoots up to a tremendous height. Thus, in this great panorama, there are three smoking volcanoes set in a splendid frame of mountain, sand, plain, and cloud; over all, the glorious colouring of the tropical morning.

The Bromo is reached by riding over the sand-sea and half-way up the mud-and-lava cone until a rough, ladder-like wooden stair is found leading to the brim. These are annually replaced by the Tenggerese, who hold here a festival in honour of their chief deity—really the volcano. The priests ascend and throw offerings into the crater; nowadays nothing larger than a chicken is thus sacrificed—it was not always so!

What is seen from the brim is a huge mud funnel leading down to an opening exactly like a limekiln, through the walls of which burst out jets of steam and sulphurous fumes. Small streams of ashes are shot up and roll back again. Perpetual steam clouds float upwards, and the tremendous roar never stops.

The natives who live in the Tengger villages are the descendants of a hardy Javanese race. Partly Hindu, partly spirit worshippers, who retreated with their old religion before the spread of Islam, and at last, unconquered, took sanctuary in these then almost inaccessible ridges. They are somewhat like the Ghurkas of British India. Their houses are built of bamboo, dragged up from below; they face the Bromo which they worship. Their business is the cultivation of vegetables, and this they can do on the very steepest slopes on which a cabbage can cling. An odd thing about them is that they do not eat rice, a relic of the days of persecution by the rice-eating Mahommedan invader, and most remarkable in that rice-growing country.

Around the Sanatorium, roses, heliotrope, and fuchsias grow wild. Great bushes of white-bellied datura are also seen everywhere.

By the aid of ponies, excursions can be made among the hills in many directions, and there are some small hotels where a night can be passed. Some of these roads wind in and out through the tropical forest amid huge tree ferns and waterfalls. A longer excursion is to the Smeroe, which is as active as can be desired.

As regards clothing, European warm clothes are necessary. Whilst it is often possible to wear the silk or drill of the Tropics at mid-day, yet the mornings and evenings are very cold. Riding costume is hardly needed; some old things are useful. A pair of warm slippers for use on the cement floors are comfortable. It would be well in passing through Sourabaya to make provision of books. Tauchnitz editions are nearly always procurable. Photographers should remember that English sizes in plates and films are not easily obtained.

By way of suggestion I would recommend: "More level walks are needed, or at least one broad Mall should be cut out on the

hill-side, if possible making it a circular road so that invalid rickshaws and children's carts could be used on it. Owing to the formation of the mountain this might prove difficult of accomplishment."

For the sake of brevity I have scheduled expenses together:—

	f.	c.
First-class rail. Sourabaya-Pasoeroean ... ..	2	75
Dog cart to Poespo ... ..	5	50
Saddle pony to Tosari ... ..	2	0
Invalid carriage and litter. Pasoeroean to Tosari	29	50
Pony, Bromo trip ... ..	3	50

#### ACCOMMODATION.

Visitors over one week, per day ... ..	6	0
„ „ 26 days, per day ... ..	5	0
A nurse's lodging over 26 days, per day ... ..	4	0

No extra charge is made for invalid cookery. Pavilions are the same rates. The guilder or florin = 1s. 8d., *i.e.*, 12 florins = £1.

The Hotel books showed that the number of English visitors for one year was roughly 102 (Australian 20) and 23 Americans. I was unable to sort out the other nationalities. May and June are the best months in Java.

In conclusion, my best thanks are due to Dr. Rademaker, jun., the resident Medical Director, for much kindly help in writing these notes and for the courtesy and kindness which made my stay so enjoyable. I am also indebted to Mr. O. Kurkdjaan, of Sourabaya, who kindly allowed me to reproduce two of his photographs.



## Reports.

### THIRD REPORT OF THE COMMITTEE ON PHYSIOLOGICAL EFFECTS OF FOOD, TRAINING AND CLOTHING ON THE SOLDIER.

#### APPENDIX V.

(Continued from p. 332.)

#### COMPOSITION OF EMERGENCY RATIONS, BY MAJOR W. W. O. BEVERIDGE, D.S.O., R.A.M.C.

TWENTY tins were received from the Assistant Director of Supplies, Woolwich, for analysis, on February 24th, 1908.

The samples consisted of two different varieties: (a) one dated December, 1907, lacquered purplish blue tins, and (b) one, not dated, lacquered blue.

There were ten of each brand and all the tins were sound. The paper wrappers were in good condition and practically fat free.

The contents of both samples were in excellent condition, but some had a slight discoloration in places, which is common to chocolate when compressed. The taste was palatable, showing no rancidity or acidity.

In my opinion the ration would have been more palatable if the amount of cane-sugar had been slightly increased, but there may be Service objections to this.

The average calories per lb. worked out for the International Plasmon at 2,380, and for that of Caley and Sons at 2,415, or 997 and 861 per tin of 6½ ounces.

The following table gives the result of eighteen analyses from three tins of each sample:—

A.—EMERGENCY RATION. (DATE NOT MARKED ON TIN.) BLUE.

No. of sample	Moisture	Fat	Total N.	N. x 6·3	Ash	Cane sugar	Cocoa-red, starch and cellulose
	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
1	2·37	30·04	5·29	33·32	3·72	22·65	7·90
2	2·19	24·67	5·28	33·26	3·80	22·79	13·29
3	2·12	27·32	4·69	29·54	3·60	22·89	14·53
Average	2·23	27·34	5·09	32·04	3·71	22·78	11·90

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B.—EMERGENCY RATION. (DATED AUGUST, 1907.) PURPLE.

No. of Sample	Moisture	Fat	Total N.	N. x 6·3	Ash	Cane-sugar	Cocoa-red, starch and cellulose
	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
1	2·33	29·22	4·91	30·93	3·69	19·59	14·24
2	2·10	29·32	4·98	31·37	3·83	23·09	13·29
3	2·29	26·49	4·87	30·68	3·77	20·65	16·12
Average	2·57	28·34	4·92	30·99	3·76	20·11	14·55

NOTES.—The samples conformed fairly well to the Specification (No. 59).

In one case the fat was somewhat below the minimum, one was below in quantity of total carbohydrates and one was below in protein (T.N. x 6·3) owing to a higher percentage of cane-sugar. These varieties all occurred in the undated samples.

*Fat.*—It was observed that on extracting the fat in Davis's apparatus, the fat-free thimble allowed the cocoa-red to filter through, but we found that this could be entirely obviated by using instead two layers of filter paper, a pure cocoa-fat remaining.

*Starch.*—Starch was shown to be present by the iodine reaction on microscopical examination, but the blue colour was not to be detected by the naked eye.

In order to compare the analyses with the Specification we have multiplied the total nitrogen by the factor 6·3, but it is more usual at the present time to employ the factor 6·25 as being more accurate, or if for estimation as casein, by the factor 6·38.

## APPENDIX VI.

### NOTES ON RATIONS OF DIFFERENT ARMIES IN PEACE AND WAR, BY LIEUTENANT-COLONEL W. G. MACPHERSON, C.M.G., R.A.M.C.

FRANCE.—The system of rationing troops both in peace and war, and on manœuvres, differs so much in different countries that it is difficult to prepare a single table which would be satisfactory for comparative purposes. It is better, therefore, to deal with each country in a separate note.

The following notes deal with the French rations:—

The ration varies according to whether the soldier is (1) in barracks; (2) on manœuvres, or (3) on field service, and during field service there is also considerable variation to meet different circumstances.

*Peace or Barrack Ration.*—Bread is the only ration manufactured and issued by the military authorities. Other articles of food are purchased locally by the regimental authorities, but a certain amount of coffee and

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sugar is also issued in kind. Allowances are given regimentally per head per diem for the purchase of meat and other articles of food; the sum varies according to place and season. The rule regarding meals is to give coffee and bread the first thing in the morning, and two meals subsequently, one, the *soupe du matin*, at 10 a.m. or 10.30 a.m., and the other, the *soupe de soir*, at 5 p.m. or 5.30 p.m. The meals correspond in fact to the ordinary civilian meals in France, *déjeuner*, *déjeuner à la fourchette*, and *dîner*, the two latter being similar in character, and consisting of one or two dishes.

Whether issue is in kind or by purchase, the following are the normal quantities of each article of food:—

Government bread	..	..	..	750	grammes.	
White bread for soup	..	..	..	250	„	(purchased locally).
Fresh meat, with bone	..	..	..	320	„	
Potatoes	..	..	..	100	„	
Rice	..	..	..	30	„	(or 60 grammes dried vegetables).
Lard	..	..	..	30	„	(or 40 grammes suet).
Salt	..	..	..	16	„	
Sugar	..	..	..	21	„	
Coffee, roasted	..	..	..	16	„	

The above is the normal ration, but in time of peace the regimental cooks must vary the ration as much as possible, and there is a regular tariff of substitutes for the meat and vegetable (rice) ration.

Thus, the meat ration can be replaced by 400 grammes of veal, mutton, pork, rabbit, fowl, horse, or fresh fish; by 300 grammes of black puddings, eggs, or cream cheese; by 250 grammes of salt cod; by 200 grammes of smoked beef (American or Australian), corned or salt beef, pickled tunny fish, herring, or sardines; by 200 grammes of Dutch, Gruyère, Cheddar, Swiss, Roquefort, or Parmesan cheese; by 100 grammes of sardines in oil; by 150 grammes sausages, caviare, or smoked herring; by 100 grammes dried cod, or meat powder, or by 2½ litres of milk.

The rice ration can be replaced by 450 grammes potatoes; 600 grammes turnips, carrots, or cabbage; 360 grammes preserved turnips; 60 grammes semolina or pearl barley; 90 grammes of chestnuts; 70 grammes of preserved vegetables (haricots, peas, &c.); 120 grammes of dried fruit; 60 grammes of wheat flour; 60 grammes of macaroni, vermicelli, &c.; 60 grammes of maize flour; 50 grammes of haricot, lentil, or pea flour; 40 grammes of Gruyère or Dutch cheese, or 60 grammes of cream cheese.

The regulation allowance of coffee can be replaced by 5 grammes of tea.

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The French peace ration is calculated by most recent French writers on military hygiene to contain the following nutritive elements:<sup>1</sup>—

Proteins .. .. .	125.06 grammes.
Fats .. .. .	60.46 „
Carbohydrates .. .. .	573.52 „ or
3,426.456 calories.	

*Ration during Manœuvres.*—The ration on manœuvres is less than that in barracks. The Government bread ration, rice, potatoes, salt, sugar, and coffee are the same, but the meat is 300 instead of 320 grammes, and no lard or its equivalent is allowed; nor is there any white bread (*pain de soupe*) in the ration. The reason of this is that general officers commanding troops on manœuvres have power to add a supplementary ration according to circumstances, as in the time of war, and they generally do so by adding to the quantity of meat and bread, allowing the 250 grammes of white bread to be obtained, as in barracks, from local bakeries.

The nutritive elements and calories of the manœuvre ration, including 250 grammes *pain de soupe*, but not including other supplementary rations, are calculated to be:—

Proteins .. .. .	121.70 grammes.
Fats .. .. .	28.92 „
Carbohydrates .. .. .	584.52 „ or
3,164.458 calories.	

*War Ration.*—There are two kinds of war ration, the normal field ration and the augmented ration (*ration forte*). The nature and quantities of these are:—

	Normal ration	Augmented ration
	Grammes	Grammes
Government bread .. ..	750	750
Fresh meat, with bone .. ..	400	500
Potatoes .. .. .	100	100
Rice .. .. .	60	100
Lard .. .. .	30	30
Salt .. .. .	20	20
Sugar .. .. .	21	31
Coffee, roasted .. .. .	16	24

The augmented ration, it will be noted, is the same as the normal with the addition of 100 grammes to the meat, 40 grammes to the rice, 10 grammes to the sugar, and 8 grammes to the coffee. The

<sup>1</sup> "Traité d'Hygiène" (Brouardel and Mosny), vol. ix., "Hygiène Militaire," by Rouget and Dopfer, 1907, p. 85.

The calculations are made according to Theinert and Koenig's tables. According to Atwater and Bryant's tables the same ration would give 148 grammes protein, 92 grammes fat, 595 grammes carbohydrates, or a total of 3,881 calories, as calculated by Dr. Pembrey.



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normal war ration, as compared with the peace ration, has 250 grammes *pain de soupe* less, but 80 grammes meat, 30 grammes rice, and 4 grammes salt, more.

But an important addition can be made to either the normal or augmented ration, when ordered by the general officer commanding, under certain conditions. The usual additions are:—

$\frac{1}{2}$  litre wine or  $\frac{1}{8}$  brandy,  
250 grammes of bread,  
100 grammes of meat, or

a fraction of the whole ration, normal or augmented, such as  $\frac{1}{2}$ ,  $\frac{1}{3}$ , or  $\frac{1}{4}$ .

The nutritive value of the war rations, exclusive of supplementary rations, is:—<sup>1</sup>

	Normal	Augmented
	Grammes	Grammes
Protein .. .. .	123·60	143·20
Fat .. .. .	64·74	72·30
Carbohydrates .. .. .	476·99	517·95
Calories .. .. .	3,064·501	3,383·10

With *pain de soupe* (250 grammes) added, the calories become 3,686·541 and 4,005·14, respectively.

But this scarcely represents the whole of the French system of rationing during war. There are different rations for troops coming to their mobilization depôts; for troops during journeys by rail, &c. For example, on journeys by rail each soldier has issued to him 375 grammes bread, 125 grammes tinned meat, 5 grammes salt, for every twelve hours or lesser period of the journey; he has given him in addition every twenty-four hours one meal of cold beef, sausages, cheese, or similar articles, purchased before starting on the journey in sufficient quantity to last the whole journey; and he has a ration of 25 centilitres of hot coffee, 10 grammes sugar, and a dash of brandy every twenty-four hours.

There is also a system of rationing troops by billeting on the inhabitants of the country (*Nourriture chez l'habitant*). This is usually the manner of providing rations for cyclists, telegraphists, and other small or isolated groups; but the general commanding may order it for larger bodies of troops. In these cases the composition of the meals given and the price are fixed by the military authorities, who take into consideration the resources and habits of the locality.

The emergency ration (*vivres du sac* or *de réserve*) is carried in the haversack and only allowed to be used under orders. It is a two days' ration and consists of—

<sup>1</sup> *Op. cit.*

1,200	grammes	biscuit.
60	„	rice.
60	„	dried vegetables.
400	„	tinned meat.
50	„	concentrated soup.
40	„	salt.
42	„	sugar.
32	„	coffee.

Half these quantities constitute a day's ration, and this is calculated to be equal to 2,130 calories only, or 2,515 if the concentrated soup is made of bean or pea flour.

*Preserved Meat.*—In France, tinned meat, frozen meat, half-salted and salted meat are used in war, but only when fresh meat is not obtainable. There is a turnover of stores by occasional issues in peace.

The tinned meat supplied to the French Army is usually boiled beef prepared by the Chevallier-Apert process by sterilization in an autoclave. The supplies are prepared in civil factories under certain conditions, amongst which are the following :—

(1) A military veterinary officer must examine the animals before they are killed, and the carcase after slaughter.

(2) A military quartermaster for supply (*officier d'administration du service des subsistances*) must supervise all details of manufacture.

Both these officers are permanently attached to the factory during the whole time of the manufacture of Government supplies; and no work is allowed to be carried on at night.

In addition to this local supervision, surprise visits are made by technical experts, and no deliveries of goods are finally settled until they are passed by a committee composed of a senior military officer as president, one medical officer, one pharmacist officer, and two civilian experts. The committee has to certify :—

(1) That the tinning, interior and exterior soldering, such as can come in contact with the contents, is of the best tin (*étain fin*). In France this must contain 98 per cent. pure tin at least. The impurities allowed are iron, copper and lead, not more than 0.6 per cent. of lead being allowed, and 2 per cent. of total impurities.

(2) That the gravy (*bouillon*) gives the following results on chemical analysis :—

Extracts (evaporated at 101° to 103° C.)	..	..	..	12 per cent.
Mineral matter	..	..	..	1.30 „
Substances soluble in alcohol at 80° C.	..	..	..	5 „

(3) That the meat has been properly dressed (*i.e.*, that there are no lumps of fat, pieces of tendon or bone); that the gravy makes a clear amber-coloured and homogeneous jelly at 16° C.; that no gas-forming anaerobic micro-organisms grow after several days' incubation at 37° C.

In addition, the contractor is responsible for any changes that may occur from defect of manufacture during eighteen months.

The weight of the tinned meat net is 1 kilogramme, of which eight-tenths are meat and two-tenths gravy and fat. The fat must not exceed 60 grammes. The ration of this to each man is 200 grammes, so that each tin contains rations for four men.

Each tin is stamped with the nature of its contents, the place of manufacture, the name of the manufacturer, the net weight of the tin, the month and year of manufacture (*e.g.*, 7·07 for July, 1907). The tins are preserved from rust by paint.

There is another form of preserved meat in tins, namely, the tinned sausages, or *saucisses Boissonet*. The net weight is 250 grammes, and each tin contains two sausages of 100 grammes, and 50 grammes of lard. The sausages are made of two-fifths fat and three-fifths muscular tissue, half being beef, veal, or mutton, and half pork. They are used as a concentrated soup for making *bouillon* or *ragout*, with rice, vegetables and bread. Each man gets 25 grammes as his portion, so that a tin makes a soup for ten men. It is much appreciated by the French soldiers. The tins are kept two years and then turned over.

Frozen and salted meat are not much used. The frozen meat is specially intended for issue during a march, as it can be carried in wagons for a few days after leaving the refrigerator without going bad. The half-salted meat is intended for issue during eight or ten days after slaughter. The salt meat is the ordinary junk of sailors, and is kept for two years.

#### GERMANY.

In Germany the troops are rationed in a very complicated manner. They either receive all their rations in kind, or they receive bread in kind, and the remaining rations in the form of a money allowance, or they may receive one or more of the meals (morning, mid-day and evening) in kind and the other meals in the form of money allowance, or they may receive a money allowance for full ration and nothing in kind.

Further, the ration for purposes of allotment in kind or in money allowance is divided into a bread ration (*Brodportion*) and a catering ration (*Beköstigungsportion*), with a bread allowance (*Brodgeld*) and a catering allowance (*Beköstigungsgeld*). Then, again, the catering ration is of two kinds, a large or a small ration, with corresponding higher or lower scale of money in lieu.

*Peace Ration.*—The table on p. 465 is the daily scale of rations in kind during peace, those in brackets being alternatives for the article immediately preceding them :—

The meals are an early morning meal of coffee and bread with milk or soup, a mid-day meal, and an evening meal.

The mid-day meal is the chief meal. The meat is given with the mid-day meal, and the evening meal is usually a soup with bread.

	Small ration	Large ration
	Grammes	Grammes
Bread .. .. .	750	750
(Field biscuit) .. .. .	(500)	(500)
(Egg biscuit) .. .. .	(400)	(400)
Coffee, roasted .. .. .	10	15
Fresh meat, beef, mutton or pork	180	250
(Smoked meat) .. .. .	(120)	(200)
(Tinned meat) .. .. .	(100)	(200)
Kidney fat .. .. .	40	60
Peas, beans, or lentils .. .. .	250	250
(Rice, groats, barley, &c.) .. .. .	(125)	(125)
(Dried vegetables) .. .. .	(60)	(60)
(Preserved vegetables) .. .. .	(150)	(150)
(Potatoes) .. .. .	(1,500)	(1,500)*
Salt .. .. .	25	25

\* Or half the quantity of dried vegetables and 750 grammes of potatoes, or 100 grammes preserved vegetables and 500 grammes potatoes.

The money allowance is  $1\frac{1}{4}$ d. for the bread ration. Salt and articles which do not vary in price are allowed for at the rate of 3 pfennings ( $\frac{1}{3}$  of a penny) for morning meal, 3 pfennings for the fat portion of the mid-day and evening meal, and 10 pfennings ( $1\frac{1}{4}$ d.) for the vegetable portion of the mid-day and evening meal. The meat portion money allowance is variable and is based on a sliding scale according to market and local prices.

The allowance for the larger portion is the allowance for the smaller portion with 15 pfennings (about  $1\frac{3}{4}$ d.) added.

When money allowance is given in whole or in part it is in accordance with the following scale per man daily :—

	Including bread	Excluding bread
(1) For complete ration ..	80 pfennings ( $9\frac{1}{4}$ d.)	65 pfennings ( $7\frac{3}{4}$ d.)
(2) For mid-day meal ..	40 pfennings ( $4\frac{1}{4}$ d.)	35 pfennings ( $4\frac{1}{4}$ d.)
(3) For evening meal ..	25 pfennings (3d.)	20 pfennings ( $2\frac{1}{4}$ d.)
(4) For morning meal ..	15 pfennings ( $3\frac{1}{4}$ d.)	10 pfennings ( $1\frac{1}{4}$ d.)

It may be noted also that in Germany parents are encouraged to send hampers to their sons who are serving with the colours, and a specially low rate of postage is allowed on such packages.

Officers get a higher allowance, namely, 2.150 marks (2s. 6d.) for full ration, 1.25 (1s. 3d.) for mid-day meal, 9d. for evening meal, and 6d. for morning meal.

*Manœuvres Ration.*—In manœuvres, when food is given in kind, the large peace ration is given ; but in the manœuvres of 1905 the men were billeted on the inhabitants, who received 80 pfennings ( $9\frac{1}{4}$ d.) per head

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daily for feeding them. The food supplied had to be equivalent in quantity to the larger ration. This ration is estimated as being equal to 3,202 calories.

*War Ration.* — The field ration (*Kriegsportion*) consists of the following:—

Bread .. .. .	750 grammes.
(Biscuit) .. .. .	(500) „
(Egg Biscuit) .. .. .	(400) „
Coffee, roasted .. .. .	25 „
(Tea) .. .. .	(3) „
Sugar .. .. .	17 „
Fresh meat .. .. .	375 „
(Salt meat) .. .. .	(375) „
(Tinned meat) .. .. .	(200) „
(Bacon, sausage, smoked beef, pork or mutton, salt pork, &c.) .. .. .	(200) „
Peas, beans, lentils .. .. .	250 „
(Rice, groats, &c.) .. .. .	(125) „
(Preserved vegetables) .. .. .	(150) „
(Potatoes) .. .. .	(1,500) „

This ration can be increased, as in the case of the French ration, by the General Officer in command, according to circumstances. The ration is then called the special field ration (*ausserordentliche Kriegsviktualportion*) and consists of:—

Bread .. .. .	1,000 grammes.
Meat .. .. .	500 „
Peas, beans, or lentils .. .. .	340 „
(Rice or groats) .. .. .	(170) „
(Potatoes) .. .. .	(2,000) „
(Butter) .. .. .	(50) „
Coffee .. .. .	25 „
Spirits .. .. .	$\frac{1}{10}$ litre.
Salt .. .. .	25 grammes.

The nutritive elements of the various rations are estimated as follows:—

	Protein	Fat	Carbo- hydrates	Salts	Calories
	Grammes	Grammes	Grammes	Grammes	Grammes
Peace ration (small portion) ..	144	56	500	25	3161
Manœuvre ration (large portion)	159	89	488	44	3480
War ration (normal) .. ..	118	68	411	31	2801

The latest works on military hygiene in Germany draw attention to the insufficiency of the war ration, which it is said ought to contain 150 grammes protein, 100 grammes fats, and 500 grammes carbohydrates, giving 3,575 calories.

The emergency ration (*eiserne Field-mundportion*), which is carried by each soldier and used only under orders, consists of:—

Field biscuit .. .. .	500 grammes.
Tinned meat .. .. .	200 „
Preserved vegetables .. .. .	150 „
Coffee, roasted .. .. .	15 „
Salt .. .. .	25 „

The soldier carries two such rations with him.

The above is the ration obtained in November last for inspection at the British War Office; but there appears to be some change since. Barthelmes ("Grundsätze Militärgesundheitspflege," 1907) says that for the first few days after mobilization an emergency ration of 250 grammes bread, 200 grammes tinned meat, 150 grammes tinned vegetables, 25 grammes salt, and 25 grammes coffee is given; and later on a ration of 400 grammes meat biscuit, 200 grammes tinned meat and vegetable, 25 grammes salt, and 25 grammes coffee. The value of the ration is estimated by Dr. Pembrey to be 142 grammes proteins, 49 grammes fat, 420 grammes carbohydrates, or 2,766 calories.

*Preserved Meat.*—So far as can be gathered the German tinned meat, at any rate such as was used in the recent German expeditions, consists of four varieties. Analyses of these appeared in the German Army Medical Department report for 1902-03, and their percentage composition was given as follows :—

Nature of contents	Water	Proteins	Fat	Ash	Tendon	Non-nitro- genous substances
	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
(1) Corned beef .. ..	65·80	24·60	6·23	2·28	..	1·09
(2) Mutton and cabbage ..	80·10	7·36	5·94	1·23	3·67	1·70
(3) Beef and peas .. ..	66·65	10·86	3·89	1·45	1·79	15·36
(4) Pork and cabbage .. ..	75·22	5·02	12·54	1·10	3·53	2·59

*Note.*—For the purpose of estimating the energy value of the German rations, the following percentage composition is given in the official supply regulations (*Verpflegungs Vorschriften*) :—

	Water	Proteins	Fat	Carbo- hydrates	Salts
	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
Bread, rye .. ..	45·0	6·0	1·5	46·5	1·2
„ white .. ..	35·5	7·1	0·46	56·6	1·09
Field biscuit .. ..	12·3	13·1	1·1	71·6	1·9
Beef, average .. ..	73·0	21·0	5·4	0·46	1·14
„ thin .. ..	76·4	20·7	1·7	—	1·18
Mutton .. ..	76·0	17·1	5·8	—	1·33
Pork, fat .. ..	47·4	14·5	37·3	—	0·72
Smoked beef .. ..	47·7	27·1	15·4	—	10·6
„ bacon .. ..	10·5	5·0	78·0	—	6·5
Salt pork .. ..	9·2	9·7	75·8	—	5·38
Rice .. ..	12·6	6·7	0·88	78·5	0·82
Groats (oats) .. ..	9·7	13·4	5·9	67·0	2·12
Barley groats .. ..	15·1	11·8	1·7	70·9	0·47
Peas .. ..	13·9	23·2	1·9	52·7	2·68
Beans .. ..	13·5	25·3	1·68	48·3	3·13
Lentils .. ..	12·3	25·9	1·9	52·8	3·04
Dried vegetables, average ..	11·0	12·0	2·5	68·5	6·0
Preserved vegetables .. ..	8·0	18·5	21·0	41·5	11·0
Vegetables .. ..	75·0	2·1	0·16	21·2	1·09

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## UNITED STATES OF AMERICA.

The United States ration varies in components according to the station of the troops or the nature of the duty performed, being severally known as the garrison ration, the field ration, the travel ration, the Filipino ration, and the emergency ration. The garrison ration is issued to the troops in garrison or permanent camps; the travel ration to troops traveling otherwise than by marching, or when for short periods they are separated from cooking facilities; the field ration to troops not in garrison or permanent camps; the Filipino ration for use of Philippine scouts; and the emergency ration to troops in active campaign for use on occasions of emergency.

The kinds and quantities composing the garrison ration, the field ration, the travel ration, and the Filipino ration, and the quantities computed for 100 rations, are as follows:—

### (1) *Garrison Ration.*

Articles	Quantities per ration		Quantities per 100 rations	
	ozs.	gills.	lbs. ozs.	galls.
<b>Meat components—</b>				
Fresh beef .. .. .	20	..	125 0	..
Or fresh mutton, when the cost does not exceed that of beef	20	..	125 0	..
Or bacon .. .. .	*12	..	75 0	..
Or canned meat, when impracticable to furnish fresh meat	16	..	100 0	..
Or dried fish .. .. .	14	..	87 8	..
Or pickled fish .. .. .	18	..	112 8	..
Or canned fish .. .. .	16	..	100 0	..
<b>Bread components—</b>				
Flour .. .. .	18	..	112 8	..
Or soft bread .. .. .	18	..	112 8	..
Or hard bread, to be ordered, issued only when impracticable to use flour or soft bread.. .. .	16	..	100 0	..
Or corn meal† .. .. .	20	..	125 0	..
<b>Vegetable components—</b>				
Beans .. .. .	2½	..	15 0	..
Or peas .. .. .	2½	..	15 0	..
Or rice .. .. .	1½	..	10 0	..
Or hominy .. .. .	1½	..	10 0	..
Potatoes .. .. .	16	..	100 0	..
Or potatoes 12½ ozs., and onions 3½ ozs. .. .. .	16	..	100 0	..
Or potatoes 12½ ozs., and canned tomatoes 3½ ozs. .. .. .	16	..	100 0	..
Or potatoes 11½ ozs., and other fresh vegetables (not canned) 4½ ozs., when they can be obtained in the vicinity or transported in a wholesome condition from a distance	16	..	100 0	..
Or desiccated vegetables,‡ when impracticable to furnish fresh vegetables	2½	..	15 0	..

\* In Alaska 16 ozs. of bacon, or 16 ozs. of salt pork, or 22 ozs. of salt beef.

† In Alaska the allowance of fresh vegetables will be 24 ozs. instead of 16 ozs.

‡ In Alaska 3½ ozs. instead of 2½ ozs.



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*Garrison Ration—continued.*

Articles	Quantities per ration		Quantities Per 100 rations	
	ozs.	gills.	lbs. ozs.	galls.
Fruit components—				
Dried or evaporated fruits (prunes, apples, or peaches), 30 per cent. of the issue to be prunes when practicable	1 $\frac{3}{5}$	..	10 0	..
Coffee and sugar components—				
Coffee, green .. .. .	1 $\frac{3}{5}$	..	10 0	..
Or roasted and ground coffee .. .. .	1 $\frac{3}{5}$	..	8 0	..
Or tea, black or green .. .. .	$\frac{1}{5}$	..	2 0	..
Sugar.. .. .	3 $\frac{1}{5}$	..	20 0	..
Seasoning components—				
Vinegar .. .. .	..	$\frac{1}{5}$	..	1
Or vinegar $\frac{4}{5}$ gill, and cucumber pickles $\frac{4}{5}$ gill ..	..	$\frac{4}{5}$	..	1
Salt .. .. .	$\frac{1}{5}$	..	4 0	..
Pepper, black .. .. .	$\frac{1}{5}$	..	0 4	..
Soap and candle components—				
Soap* .. .. .	..	..	1 ..	..
Candles (when illumination is not furnished by the Quartermaster's Department)	$\frac{6}{5}$	..	1 8	..

\* In Alaska 8 $\frac{6}{5}$  oz. instead of 6 $\frac{6}{5}$  oz.

(2.) *Field Ration.*

Meat components—				
Fresh beef or mutton, when procurable locally ..	20	..	125 0	..
Or canned meat, when fresh meat cannot be procured locally	16	..	100 0	..
Or bacon .. .. .	12	..	75 0	..
Bread components—				
Flour .. .. .	18	..	112 8	..
Or soft bread .. .. .	18	..	112 8	..
Or hard bread .. .. .	16	..	100 0	..
Baking powder, when ovens are not available ..	$\frac{1}{5}$	..	4 0	..
Or hops, when ovens are available .. .. .	$\frac{1}{5}$	..	0 2	..
Or dried or compressed yeast, when ovens are available	$\frac{1}{5}$	..	0 4	..
Vegetable components—				
Beans .. .. .	2 $\frac{3}{5}$	..	15 0	..
Or rice .. .. .	1 $\frac{3}{5}$	..	10 0	..
Potatoes, when procurable locally .. .. .	16	..	100 0	..
Or potatoes 12 $\frac{4}{5}$ ozs., and onions 3 $\frac{1}{5}$ ozs., when pro- cured locally	16	..	100 0	..
Or desiccated potatoes .. .. .	2 $\frac{3}{5}$	..	15 0	..
Or desiccated potatoes 1 $\frac{3}{5}$ ozs., and desiccated onions $\frac{1}{5}$ oz.	2 $\frac{3}{5}$	..	15 0	..
Or desiccated potatoes 1 $\frac{3}{5}$ ozs., and canned tomatoes 3 $\frac{1}{5}$ ozs.	5 $\frac{3}{5}$	..	32 0	..
Fruit components—				
Jam, in cans .. .. .	1 $\frac{3}{5}$	..	8 12	..
Coffee and sugar components—				
Coffee, roasted and ground .. .. .	1 $\frac{7}{5}$	..	8 0	..
Or tea, black and green .. .. .	$\frac{1}{5}$	..	2 0	..
Sugar .. .. .	3 $\frac{1}{5}$	..	20 0	..



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## *Field Ration—continued.*

Articles	Quantities per ration		Quantities per 100 rations	
	ozs.	gills	lbs. ozs.	galls.
Seasoning components—				
Vinegar .. .. .	..	$\frac{1}{3}$	..	1
Or vinegar $\frac{4}{3}$ gill, and cucumber pickles $\frac{4}{3}$ gill	..	$\frac{1}{3}$	..	1
Salt .. .. .	$\frac{1}{3}$	..	4 0	..
Pepper, black .. .. .	$\frac{1}{3}$	..	0 4	..
Soap and candle components—				
Soap .. .. .	$\frac{1}{3}$	..	4 0	..
Candles .. .. .	$\frac{1}{3}$	..	1 8	..

## (3) *Travel Ration.*

Soft bread .. .. .	..	..	112 8	..
Or hard bread .. .. .	..	..	100 0	..
Canned corn beef, or corned-beef hash ..	..	..	75 0	..
Baked beans .. .. .	..	..	25 0	..
Canned tomatoes .. .. .	..	..	50 0	..
Coffee roasted and ground .. .. .	..	..	8 0	..
Sugar .. .. .	..	..	15 0	..

## (4) *Filipino Ration.*

Meat components—				
Fresh beef .. .. .	12	..	75 0	..
Or bacon .. .. .	8	..	50 0	..
Or canned meat .. .. .	8	..	50 0	..
Or canned fish .. .. .	12	..	75 0	..
Or fresh fish .. .. .	12	..	75 0	..
Bread components—				
Flour .. .. .	8	..	50 0	..
Or hard bread .. .. .	8	..	50 0	..
Baking powder (when in field and ovens are not available)	$\frac{1}{3}$	..	2 0	..
Vegetable components—				
Rice .. .. .	20	..	125 0	..
Potatoes .. .. .	8	..	50 0	..
Or onions .. .. .	8	..	50 0	..
Or desiccated vegetables .. .. .	$1\frac{1}{3}$	..	7 8	..
Coffee and sugar components—				
Coffee, roasted and ground .. .. .	1	..	6 4	..
Sugar .. .. .	2	..	12 8	..
Seasoning components—				
Vinegar .. .. .	..	$\frac{2}{3}$	..	1
Salt .. .. .	$\frac{1}{3}$	..	4 0	..
Pepper, black .. .. .	$\frac{1}{3}$	..	0 2	..
Soap and candle components—				
Soap .. .. .	$\frac{1}{3}$	..	4 0	..
Candles .. .. .	$\frac{1}{3}$	..	0 12	..

The above is taken *verbatim* from the "Handbook of the Hospital Corps," by Major C. F. Mason, published in 1906, p. 229. The scales are slightly different from the soldiers' rations given in Munson's "Military Hygiene," published in 1901. Munson gives the maximum quantity of the peace ration as equal to 4,061 calories, and the minimum

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value of any combination of alternatives as 2,321 calories. A selection of such articles as are commonly used by troops in garrisons gives 3,296 calories. But the American soldier makes certain savings in rations which he is obliged to spend in purchasing other articles of food. In some cases the amount so spent enables him to buy about one-fifth of the regulation ration in addition.

The hours of meals in the American Army are usually 6.30 a.m., noon, and 5 or 6 p.m.

The travel ration is calculated to give 2,735 calories for each man.

The United States Army emergency ration is given by Munson as follows :—

Biscuit	..	..	..	..	16	ozs.
Bacon..	..	..	..	..	10	„
Pea-meal	..	..	..	..	4	„
Coffee	..	..	..	..	2	„
Salt ..	..	..	..	..	0.64	oz.
Tobacco	..	..	..	..	0.5	„
Pepper	..	..	..	..	0.4	„

The ration was selected by a board of officers, and is calculated to give 4,110 calories. It was subjected to a practical trial in the field, says Munson, in 1897, by a troop of cavalry. The men had a preliminary march of two days on ordinary rations. They were weighed, and marched for ten days, doing 21 miles each day on an average in a country where no food could be obtained from outside sources. Careful records showed an average loss of 2.935 lb. per man in the ten days; but five men gained weight and some retained their original weight.

Dr. Pembrey has made the following calculations from the above rations :—

	Proteins	Fat	Carbohydrates	Calories
	Grammes	Grammes	Grammes	
Garrison ration .. ..	167	110	603	4,179
Field ration.. ..	167	110	608	4,199
Filipino ration .. ..	125	65	705	4,007

### JAPAN.

The Japanese peace ration is about 2 lbs. of uncooked rice daily, and a money allowance to enable him to buy whatever accessory food he wants, such as fish, vegetables, meat, &c. In some cases the 2 lbs. of rice are replaced by about 1 lb. 6 ounces of rice, and 10 ounces of barley.

In war, *i.e.*, during the campaign in Manchuria, the following was the ration of one of the fighting battalions during the summer of 1905, in the front line. It is divided into a daily issue, a periodic issue, and an irregular issue :—

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### (a) *Daily Issue.*

Rice (uncooked)	..	..	..	..	32 ozs.	The value of the ration as calculated by Dr. Pembrey is— Protein, 158 grammes Fat, 27 grammes Carbohydrates, 840 grammes Calories, 4,343.
Tinned meat	..	..	..	..	5·3 „	
Tinned salmon or other fish	..	..	..	..	5·3 „	
Dried vegetables	..	..	..	..	4 „	
Pickles	..	..	..	..	2 „	
Soyo (a kind of Worcester sauce)	..	..	..	..	1 oz.	
Miso (bean-meal made into sauce)	..	..	..	..	1 „	
Salt	..	..	..	..	$\frac{1}{2}$ „	
Sugar	..	..	..	..	$\frac{1}{2}$ „	
Tea	..	..	..	..	$\frac{1}{7}$ „	

### (b) *Periodic Issue.* (Once or twice weekly.)

Saké (Japanese spirit)	..	..	..	..	..	$\frac{1}{3}$ th litre.
Fresh meat (with bone)	..	..	..	..	..	16 ozs.
Cigarettes	..	..	..	..	..	20 pieces.

### (c) *Irregular Issue.*

Japanese cakes	..	..	..	..	8 ozs.	
Fresh fruit	..	..	..	..	Two or three oranges, peaches, apples, &c., at a time.	

Japanese cakes are usually sweetmeats of various kinds.

During the winter, and during severe exertion, a handful of sugar was issued to each man, which he was allowed to keep in his haversack and eat as he liked.

The Japanese emergency ration consisted of a tin of meat, containing one-third beef with little fat or gravy, but mixed with sugar, and a bag of cooked and desiccated rice, which formed an excellent cooked rice ration when mixed with water, equivalent in quantity to the uncooked rice ration.

The rice ration could be replaced by its equivalent in biscuits, a packet of three biscuits, weighing about 3 ounces, being equal to one-sixth of the uncooked rice ration. Six such packets were equivalent to a rice ration.

The above scale of rations was obtained direct from the battalion referred to, and was personally seen by me on the ration lists of the battalion quartermaster; but a foreign journal gives, on statements of reports by other attachés, the following scale of rations of the Japanese Army in the field:—

Rice (or biscuit)	..	..	..	..	..	1½ lbs.	
Fresh meat	..	..	..	..	..	470 grammes.	
(Salted fish)	..	..	..	..	..	(200)	
(Smoked fish)	..	..	..	..	..	(300)	
Vegetables, fresh	..	..	..	..	..	400	
„ dried	..	..	..	..	..	150	
Soyo	..	..	..	..	..	10	
Sugar	..	..	..	..	..	30	
Saké	..	..	..	..	..	$\frac{1}{10}$ litre.	
Cigarettes	..	..	..	..	..	19	} weekly.
Eggs	..	..	..	..	..	5	

RUSSIA.

The daily scale of rations<sup>1</sup> in Manchuria was—

							lbs. ozs.
Bread (rye)	..	..	..	..	..	..	2 4
Or biscuit	..	..	..	..	..	..	1 5·7
Groats (kasha)	..	..	..	..	..	..	0 3·6
Fresh meat	..	..	..	..	..	..	0 14·4
Or tinned meat	..	..	..	..	..	..	0 10·8
Or salt meat	..	..	..	..	..	..	0 10·8
Salt	..	..	..	..	..	..	0 1·65
Vegetables, fresh	..	..	..	..	..	..	0 9
„ dried	..	..	..	..	..	..	0 6
Butter or fat	..	..	..	..	..	..	0 0·75
Ground meal	..	..	..	..	..	..	0 0·6
Tea	..	..	..	..	..	..	0 0·22
Sugar	..	..	..	..	..	..	0 0·45
Pepper	..	..	..	..	..	..	0 0·025

The tinned meat, which was only served out occasionally, was of excellent quality, with good, clear jelly, and not an excessive amount of fat. The fibre was not coarse, and the flavour was good. It was kept in 1 lb. tins, the year of manufacture being noted on each tin.

The Russian peace ration<sup>2</sup> consists of—

							lbs. ozs.
Bread	..	..	..	..	..	..	2 11·2
Meat, with about 1 oz. of fat	..	..	..	..	..	..	0 10·8

A money allowance of 2½ kopecks (about 1½d.) is given in lieu of meat ration.

Every 100 men get in addition, daily, 6·7 ounces of tea and 5 lbs. 11 ounces of sugar, or about 1 ounce of sugar per man. There is also a spirit allowance.

Recently a committee, under the presidency of Professor Danilewski, of the Military Medical Academy, St. Petersburg, issued a report on the peace ration, and recommended the following:—

Bread ration.—Instead of the 2 lbs. 11 ounces (1,200 grammes) black (rye) bread issued, about 2 lbs. only should be black bread, and the rest white (wheat) bread.

Meat.—The meat ration should be in the form of cutlets, ragout, baked or roast pork instead of baked beef; the fat should be raised to 59·6 grammes per head instead of 25·6 grammes; and 100 grammes of the meat ration should be replaced by equivalent quantities of sausages, ham, corned beef, eggs, milk, &c., in order to give variety.

The fast days, of which there are very many, and on which the soldier

<sup>1</sup> Dr. Pembrey estimates the value of this ration as—

Protein	..	..	..	..	..	187 grammes.
Fat	..	..	..	..	..	27 „
Carbohydrates	..	..	..	..	..	775 „
Calories, 4,891.						

<sup>2</sup> The value of this ration, as calculated by Dr. Pembrey, is—

Protein	..	..	..	..	..	165 grammes.
Fat	..	..	..	..	..	37 „
Carbohydrates	..	..	..	..	..	648 „
Calories, 4,060.						

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gets a restricted diet, should be limited in number, and fish given on these days.

The spirit ration should be discontinued, and a special allowance of sugar given, more especially during manœuvres.

### SPAIN.

An interesting article by Don Jose, Madrid, has appeared recently in the *Memorial de Ingenieros del Ejercito*, on soldiers' rations. The author gives tables of the various meals arranged for the soldiers of his regiment (1st Regimiento Mixto de Ingenieros) during one year, according to scientific diet principles.

Three meals are given daily—breakfast, dinner, and supper, and he quotes Gautier “(La Alimentacion y los regimenes en el hombre sano y en los enfermos,” Madrid, 1904) and Rubner “(Hygiene Comparada del hombre y los animales domesticos,” Madrid, 1902) as authorities for calculating the value of the diets, and for formulating the principle that the meals compared with one another should have the following proportions of food value:—

	Proteins	Fat	Carbohydrates	Calories
	Grammes	Grammes	Grammes	Per cent.
Breakfast .. ..	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{2}{10}$	20
Dinner .. ..	$\frac{4}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	46
Supper .. ..	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{4}{10}$	34

He gives five varieties of breakfasts given in his regimental barracks, two varieties of dinners, and four varieties of suppers. In addition, he gives the fare for a special dinner given once a week, another given once a fortnight, and another on fast days.

He also gives scales of breakfast, dinner, and supper given during field (manœuvre) work, a coffee ration given during night operations, and a “gazpacho” (a kind of salad) given during hot weather.

The following is a summary of the various scales:—

### *Breakfasts.*

No. 1	No. 2	No. 3	No. 4	No. 5
Potatoes. Lard. Olive oil. White wine. Salt. Spices, &c.	Potatoes. Salt cod. Olive oil. Salt. Spices, &c.	Beans. Potatoes. Lard. Olive oil. Salt, &c.	Bread. Bacon. “Chorizo.” Olive oil. Salt, &c.	Beans. Potatoes. Bacon. Olive oil. Salt, &c.

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*Dinners.*

Fast days	No. 1	No. 2	Special weekly	Special fortnightly
Lamb. Potatoes. Olive oil. White wine. Salt, &c.	Beef. Bacon. Chick-peas. (Garbanzos). Potatoes. Vermicelli. Vegetables, fresh. Salt, &c.	Beef. Bacon. "Chorizo." Chick-peas. Beans. Potatoes. Vermicelli. Salt, &c.	Beef. Bacon. "Chorizo." Chick-peas. Potatoes. Vermicelli. Vegetables. Salt, &c.	Beef. Bacon. "Chorizo." Rice. Potatoes. Olive oil. White wine. Salt, &c.

*Suppers.*

No. 1	No. 2	No. 3	No. 4
Beef. Potatoes. Olive oil. Salt, &c.	Rice. Potatoes. Salt cod. Olive oil. Salt, &c.	Rice. Potatoes. "Chorizo." Olive oil. Salt, &c.	Rice. Potatoes. Chine of pork. Olive oil. Salt, &c.

The nutritive value of these meals is given as follows, exclusive of the ration bread, which is not shown above :—

*Breakfasts.*

Weight of	No. 1	No. 2	No. 3	No. 4.	No. 5
Proteins, grammes .. ..	11·7	17·5	29·2	17·2	29·3
Fat, " " " " " " .. ..	11·3	16·0	12·3	42·7	29·3
Carbohydrates, grammes ..	88·2	94·2	72·3	84·0	77·8

*Dinners.*

Weight of	Fast	No. 1	No. 2	Special weekly	Special fortnightly
Proteins, grammes .. ..	40·8	29·4	34·9	30·2	29·7
Fat, " " " " " " .. ..	30·7	31·3	33·2	40·1	60·4
Carbohydrates, grammes ..	126·8	139·4	134·2	136·3	111·1

*Suppers.*

Weight of	No. 1	No. 2	No. 3	No. 4
Proteins, grammes .. ..	15·4	22·9	9·7	13·8
Fat, " " " " " " .. ..	14·6	16·3	24·5	23·2
Carbohydrates, grammes ...	67·2	102·8	90·6	94·2

Combinations of these three tables are calculated to give about 3,000 calories per head daily; but in addition there is the issue of bread daily (750 grammes), which brings up the total ration value to 138 grammes

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protein, 76 grammes fat, and 652 grammes carbohydrates, or nearly 4,000 calories.

The rations on manœuvres are also distributed into breakfast, dinner, and supper, and are very similar to what has been given above, the nutritive value, without the regulation bread, being given as follows:—

	Breakfast	Dinner	Supper	Total
Proteins, grammes .. ..	13·3	19·1	13·3	45·7
Fat, grammes .. ..	18·9	35·4	32·9	87·1
Carbohydrates, grammes ..	75·9	127·0	78·4	281·3

In Spain the soldiers have excellent dining-rooms, separate from their sleeping-rooms, and the meals are served in the form of a soup or stew, which is eaten with the ration bread. The articles in the above dietaries would form the ingredients of the soup or stew.

The ordinary regulation ration of the Spanish soldier is the bread ration, manufactured and supplied by military authorities, and a money allowance for other articles, which goes to a common messing fund.

On manœuvres and active service the following scale is given:—

Bread—1 lb. 10 ozs. ; or biscuit, 1 lb. 8 ozs.  
 Fresh meat—9½ ozs. ; or preserved meat, 8 ozs.  
 Butter—4½ ozs. ; or lard or olive oil, 4½ ozs.  
 Salt—¼ ozs.  
 Coffee—½ ozs.  
 Sugar—¾ ozs.

The emergency ration is—

Biscuit—16 ozs.  
 Tinned sausage—8 ozs., in 1 oz. butter, or 19 ozs. preserved meat.  
 Coffee—½ oz.  
 Sugar—¾ oz.

### ITALY.

*Preserved Rations in Italy.*—The Italian tinned meat was analysed at the Royal Army Medical College in November, 1905. Two tins, of net weight 469 grammes, contained—

68 per cent. water.  
 20 „ protein.  
 10 „ fat.  
 2 „ salts.

The biscuit weighed 180 grammes and contained—

13 per cent. water.  
 14·11 „ proteins.  
 1·40 „ fat.  
 70·39 „ carbohydrates.  
 1·10 „ salts.

One tin and two biscuits constitute the emergency ration for one day. The Netley report gives the energy value of one biscuit and one tin as 1,067 calories.

The Italian ordinary peace ration is—

Bread—1 lb. 10½ ozs.  
 Beef—7 ozs. ; or cow beef, 7·7 ozs. ; or mutton, 8·8 ozs.  
 Flour or rice—6·3 ozs.  
 Salt—¼ oz.  
 Lard—½ oz.  
 Coffee—½ oz.  
 Sugar—½ oz.

The emergency ration is—

Two biscuits of 7 ozs. each, and 7·7 ozs. tinned meat.

SUMMARY OF VALUE OF RATIONS OF DIFFERENT COUNTRIES IN CALORIES.

Ration	France	Germany	United States of America	Japan	Russia¹
Peace ration .. .. .	3,426	3,161*	4,179*	—	4,060*
Manceuvre ration .. .. .	3,164	3,480*	—	—	—
Travel ration .. .. .	—	—	2,735	—	—
War rations -					
Normal .. .. .	3,064	2,801*	4,199	4,343*	4,891*
Augmented (without soup bread) ..	3,686	—	—	—	—
Augmented (with soup bread).. ..	4,005	—	—	—	—
Emergency .. .. .	2,130†	2,766*	4,110	—	—
Filipino .. .. .	—	—	4,007*	—	—

\* Dr. Pembrey's calculation.

† Or 2,515 with pea-soup.

## Reviews.

DISEASES OF THE HEART. By James Mackenzie, M.D., M.R.C.P. London: Henry Frowde, 1908. Crown quarto, pp. xix., 386. Price 25s. net.

This volume of the Oxford Medical Publications includes "the results of observations on affections of the heart, made during an active practice of over a quarter of a century." It is, therefore, a striking example of what may be done under conditions usually deemed inimical to scientific research, and it possesses all the charm of a record of personal work of a broad-minded observer. The human interest of the book is so great as to lead the reader on rather to the neglect of the difficulties which he passes over, and finally must return to.

The first three chapters deal with fundamental principles, the anatomy, physiology, and development of the heart, all in relation to the practical problem of treatment. The following five chapters discuss the examination of the patient, and the value of history and symptoms. Chapters IX. to XIV. deal with the physical or instrumental examination of the functions of the circulation; the following seven with abnormalities in the action of the heart, while in Chapters XXII. and XXIII. the question of contractility and tonicity is considered. Chapter XXIV. is on febrile



affections of the heart, XXV. and XXVI. on valvular defects, XXVII. on the senile heart, and the three following on various subjects. One chapter on chloroform in heart affections, one on prognosis, and two on treatment conclude the text, while four appendices are concerned with points which require fuller explanation than is given in the text.

From the Service point of view, one finds much of interest in relation to "D.A.H." in Chapter VIII. on "Heart affections and a hypersensitive nervous system." Dr. Mackenzie points out the extraordinary production of sensory phenomena following the development of a small visceral lesion in certain patients, and discusses fully the circulatory symptoms in what he calls the "X" disease, in preference to the fashionable term, neurasthenia. He points out that the "most outstanding feature is cold hands," with "dead" fingers at times, causing extreme pain on a very cold day; "very often dilation of the stomach with accumulation of blood in the abdominal veins, which can be demonstrated." The heart itself in these cases is sometimes slightly dilated, and there may be mitral and tricuspid systolic murmurs. They are very evanescent, present one minute and gone the next." Where the exaggerated nervous phenomena are due to exhaustion, not to a progressive lesion, recovery almost invariably results, though it may be delayed for a long time. In the "X" disease Dr. Mackenzie has "never found the heart trouble give rise to a serious breakdown, nor have I ever found death from heart failure in this type of patient." Treatment in such cases, apart from suggestion and explanation of the true nature of the case, resolves itself into removal of the cause of the nervous exhaustion, if this can be determined, moderate exercise, graduated, combined with proper periods of rest. In many cases resort must be had to drugs in order to ensure rest, and of these bromide of potassium is the most useful. Dr. Mackenzie points out that "heart tonics" are useless in these cases.

The chapter on prognosis is also very important, and Dr. Mackenzie very clearly shows the necessity for a rational understanding of the manner in which any symptom is produced before the future results can be discussed. Further, that "in estimating the value of any abnormal sign, or in determining the condition of a heart, the most reliable guide is the manner in which the heart responds to exertion. This, again, is but an attempt to estimate the amount of reserve force." "In individuals in whom there is a distinct limitation of the field of cardiac response, a close scrutiny should be made into the cause. It should be borne in mind that if a heart is not properly exercised its field of response becomes more and more restricted." "But with moderate training there is soon restored sufficient reserve force to enable him to perform his task without distress." This is the reason why our heart cases do not improve in hospital, where they get no proper exercise, but when invalided and thrown on their own resources they are forced to take some moderate exercise at least, and later on show the improvement which was noted by Lieutenant-Colonel R. J. C. Cottell in his examination of the invalids on temporary pensions from Chelsea Hospital.

Dr. Mackenzie's work is without doubt most valuable, and the results as presented in this volume should be in every hospital library.

R. J. S. S.

**SPRAINS AND ALLIED INJURIES OF JOINTS.** By R. H. Anglin Whitelocke, M.D., M.C., F.R.C.S.Edin. London: Henry Frowde and Hodder and Stoughton, 1909. Pp. xvi., 241; 65 illustrations and 4 charts. Price 7s. 6d. net.

This book deals with a subject of very great importance to every practitioner, and especially to the military surgeon, who has to treat so many sprains and other minor injuries, and to whom the obtaining of a good functional result in the shortest possible time must be the principal aim. Moreover, little or no useful information about the proper treatment of these injuries is to be found in the ordinary text-books, and, consequently, few medical men have any rational method of treatment, and much harm is often done by injudicious or routine methods. These cases, too, often drift into the hands of the bone-setter, and furnish him with the chief part of his *clientèle*. In the work under review, sound and scientific lines of treatment are laid down, and these are based on a lucid explanation of the anatomical and pathological conditions underlying the several lesions. The author has had long experience in the management of these injuries, and his teaching is based largely on the cases he has seen, many of which are quoted. Sprains and "internal derangements" of the knee are dealt with very fully, and the illustrations are excellent, and include a number of skiagrams very well reproduced. The book is a most valuable addition to our knowledge, and should be read by every medical officer.

C. G. S.

**THE PRACTICE OF ANÆSTHETICS.** By Rowland W. Collum, L.R.C.P. Lond., M.R.C.S.Eng., Anæsthetist to St. Mary's Hospital, the Charing Cross Hospital, &c.

**GENERAL SURGICAL TECHNIQUE.** By H. M. W. Gray, M.B., C.M.Aberd., F.R.C.S.Edin., Surgeon and Lecturer on Clinical Surgery, Royal Infirmary, Aberdeen. Edited by James Cantlie, M.A., M.B., C.M.Aberd., F.R.C.S.Eng., Surgeon Seamen's Hospital Society, Lecturer on Surgery, London School of Tropical Medicine. London: John Bale, Sons and Danielsson, Ltd. Pp. 365. Price 10s. net.

This book is divided into two parts, dealing separately with the above subjects, and is published in a handy volume, the first of a series, entitled, "The Medico-chirurgical."

The part of the work devoted to anæsthetics is most excellently and clearly written, and the matter is expounded in such a manner as to give all the essential points of the subject in small compass. To go more into detail—we find commencing at p. 88 a very good description of a method of producing anæsthesia in cleft-palate operations. On p. 85, under the heading of rhinological operations, it states: "The surgeon prefers to have his patient sitting up, and, as a rule, the narcosis must be produced by chloroform." This, the writer very truly states, throws a great responsibility on the anæsthetist, and should not be attempted by anyone who has not had a large experience in the administration of anæsthetics: with this we heartily concur.

The use of the cocaine throat spray in conjunction with chloroform is not without objections, and symptoms of cocaine poisoning may readily be induced.

On p. 193 the dangerous symptoms which nitrite of amyl (now

scarcely ever used) may relieve are described. On p. 198 the mechanism causing death during light chloroform anæsthesia is explained, and should be studied by those who ask for "only a whiff" of the drug to be given. We notice liquor strychninæ hydrochloratis recommended for hypodermic injection; it would be more modern to call it the hydrochloride. This part also contains some useful points on the administration of anæsthetics in the Tropics.

As regards the part of the volume dealing with general surgical technique, we find a chapter on the arranging of an operating theatre, anæsthetic, disinfecting, and sterilising rooms; the details are ideal, and may well be studied by all interested in hospital construction as well as by surgeons and operating theatre staffs. Under the heading of the preparation of catgut, we think that rectified spirit is used instead of methylated spirit by those who have adopted the method,

On p. 345 the ninth intercostal space in the mid-axillary line is given as a site for exploratory puncture of the pleural sac; this is dangerously low, especially on the right side. We think a sterile collodion dressing preferable to adhesive plaster for closing the exploratory puncture of the chest, and after aspiration of the knee-joint. With reference to the procedure in cases of appendicular abscess, we do not advise squeezing the site after the abscess has been opened. The iodine method of treating the operation area is not mentioned. Under the heading of lumbar puncture it would be more modern to close the test-tube with a sterile cotton-wool plug instead of a sterilised cork, as directed.

With the above exceptions, this part is replete with succinct and sound information on the practical points of surgical technique, including emergency operations, and we have no doubt that the book will be found most useful to that large proportion of medical men—those in general practice.

C. B. L.

**HIGH-FREQUENCY CURRENTS.** By H. Evelyn Crook, M.D., B.S., F.R.C.S.Eng. Second Edition. London: Baillière, Tindall and Cox, 1909. Pp. xii., 232; 49 illustrations. Price 7s. 6d. net.

The fact that this work, the first edition of which was reviewed in this Journal in January, 1907, has so soon reached a second edition shows that it has supplied a want. The new edition has been revised and brought thoroughly up to date, and gives a very clear and full account of the subject in language easily followed by the medical man who has not been able to keep his electrical knowledge quite abreast of modern researches. The book is divided into three sections, dealing respectively with the physics of high-frequency currents and the apparatus used to produce and apply them, their physiological effects and their practical applications. The first section is well illustrated by diagrams and photographs; in the second section the work of many recent workers is referred to, and in the last section numerous illustrative cases are quoted. The author, as is, perhaps, only natural, seems inclined to find this particular form of treatment applicable to a very wide range of cases. The book is thoroughly practical, and can be recommended to all who use high-frequency currents. It would be an advantage if in future editions references were given to the numerous authorities quoted, so that those who may wish to refer to the original writings could do so.

C. G. S.

**A SYSTEM OF FREE GYMNASTICS BASED ON THE SWEDISH SYSTEM, INCLUDING LIGHT DUMB-BELL DRILL.** By Serjeant-Major R. J. Betts. Aldershot: Gale and Polden, Limited. Price 1s. 6d. net.

It is rather surprising to find in the preface of a handbook of gymnastics, by an instructor of the Army Gymnastic Staff, the following paragraph: "I would specially recommend the heavy dumb-bell exercises at end of book to men of mature age, as the finest exercise at present existing for keeping fit and strong."

The use of heavy dumb-bells as recommended in this paragraph is not only quite unnecessary for physical culture, but is not without a certain amount of risk. Heavy dumb-bell exercise may, and in most cases will, increase the volume of muscles, but their use will not give that co-ordination to muscular movements, litheness of figure, or agility of movement which should be the aim of all physical culture. The use of light dumb-bells, even of one pound weight, is not necessary for physical training, and indeed may do more harm than good. This little manual as it stands, therefore, cannot be recommended. The book as a training manual would be valuable if the pages treating on dumb-bell exercises were left out altogether. It is well got up and the illustrations are well executed, except it is rather unfortunate that the man chosen to represent the arm exercise (figs. 20 and 21) would seem, from the photographs, to be a mouth-breather.

R. P.

**LECTURES ON HYSTERIA, AND ALLIED VASO-MOTOR CONDITIONS.** By Thomas Dixon Savill, M.D.Lond. London: Henry J. Glaisher. Pp. xiii., 262. Price 7s. 6d.

This most instructive book throws a lucid and interesting light on the causation, evolution and treatment of that protean malady, hysteria.

The part played by the vaso-motor system is fully dealt with, and the contributory influence of oral and gastro-intestinal conditions is dwelt upon.

Lecture X., on hysterical skin disorders, contains much valuable information. The importance of the relationship of skin diseases to hysteria, which is undoubtedly not at present sufficiently recognised, is fully gone into. The vaso-motor origin of these phenomena is discussed at length, and it is pointed out that the same vaso-motor lesions may occur within the nervous system itself and elsewhere, and produce the neuro-mimetic condition known as hysteria. With regard to the treatment of hysteria, the author points out the necessity of recognising the fact that the disease is not a pure psychosis, but possesses a pathology of its own, *i.e.*, that the disease consists of an instability or undue irritability of all the nervous and reflex centres throughout the body, and particularly those of the vaso-motor systems; that hysterical tremor, paralysis, &c., are produced by vascular changes in the nervous system; and, finally, that the essential defect in the nervous system is inborn and inherent. That is to say, the reflex centres in hysterical subjects are throughout life more unstable than those of other people.

Great emphasis is laid on the importance of rest, both mental and bodily, removal from the conditions under which the disease arose, suitable feeding, the use of electricity, symptomatic treatment by drugs, &c., etiological treatment, and educational and other preventive measures.

The section dealing with educational measures to be adopted in the prevention of hysteria is most valuable, and is well worth careful perusal by all medical officers, who may be called upon to treat children and others with hysterical tenderness. Lecture IX. contains many facts of great interest to medical officers. In military hospital practice joint disorder is often a source of great difficulty when a definite diagnosis has to be arrived at.

Many medical officers have doubtless been confronted with cases in which the question of organic disease, hysteria, or malingering has to be considered. In this lecture the hysterical condition and its relatively characteristic symptoms are fully described. Much importance is attached to the presence of Brodie's sign, which, however, as the author points out, is not invariably present. In the introduction to the book is given an excellent table of diagnosis, distinguishing the symptoms of neurasthenia, hysteria, and hypochondriasis—conditions which, in ordinary practice, are not infrequently confused. A most useful detailed list of hysterical symptoms and disorders is to be found on pp. 14 and 15.

The book is well printed on unglazed paper, and is written in a scholarly and pleasant style. It will well repay careful perusal by all who wish to obtain a good insight into the complex problems manifested by hysteria.

F. M. M.

**THE OFFICERS' TRAINING CORPS EXAMINER FOR CERTIFICATE "A."** By Captain R. F. Legge, Leinster Regiment. London: Gale and Polden, Limited, 1909. Pp. 264. Price 4s. nett.

This book contains a review of the conditions necessary to qualify for the certificate in all branches of the Officers' Training Corps, hints on written examinations, the syllabuses of subjects of examination, questions and answers concerning the subject matter, and papers that have been actually set.

It may be found useful as a guide to the examination for certificate "A" in the Cavalry, Artillery, and All Arms Branches of the Officers' Training Corps, but from the point of view of the Medical Branch its value is small, because the subject of examination has already been modified, and to this branch its interest consists in the compendious view of the duties of other branches which are obtained from it.

The work is well done and makes interesting reading, but it must be remembered that the existing regulations for the Officers' Training Corps are provisional and liable to alteration, and that such a book as this, to be of real use, must be annually re-written.

H. E. R. J.



## Current Literature.

### Changes in the Field Medical Organisation of the German Army.—

The German field regulations of March 22nd, 1908, and the instructions for baggage and ammunition columns and transport (*Bag. Kol. Tr.*) of August 22nd, 1908, have foreshadowed some important changes in the field medical organisation. The army medical battalion of which there has hitherto been one to each army corps, and which consisted of a battalion staff, three bearer companies and twelve field hospitals, has been abolished, the bearer companies becoming divisional units, and the field hospitals, units of the army corps train battalions, under the command of the commanders of these battalions or of the transport column, in which the field hospitals may be included. Restrictions, however, are placed on the exercise of disciplinary command over medical officers senior to the column or train commanders, and the latter are not allowed to interfere in the medical or administrative arrangements of the field hospitals.

**Small-pox Epidemic in Kobe, Japan, in 1907-08.**—Vaccination has been practised in Japan since 1848, but it was not until 1885 that a Vaccination Act was passed. Small-pox, however, was not eradicated and there were more or less extensive epidemics in 1886-87, 1892-93-94, and 1896-97, while every year cases of the disease were notified. In the epidemic years Kobe suffered to a very large extent, especially in 1893 and 1896; although in the years 1902-06 no cases were notified there.

The epidemic described by Dr. Amako, in the *Archiv. f. Schiff's u. Tropen-Hygiene* for July, 1909, commenced in April, 1907, and was introduced from China. It appears to have gradually assumed considerable proportions, 813 persons, 2·4 per 1,000 of the population, being affected in 1907; and 4,184, or 11·2 per 1,000, in 1908.

Dr. Amako has taken the opportunity of publishing some interesting observations in connection with the cases; 46·4 per cent. had been vaccinated, 53·5 per cent. unvaccinated; but the deaths amongst the former were only 7·2 per cent. as compared with 45·8 per cent. amongst the latter. The mortality at different ages is especially noteworthy. It is as follows:—

Age	Vaccinated				Unvaccinated			
Under 10	..	..	..	8·0 per cent.	..	..	..	48·3 per cent.
10 to 20	..	..	..	4·7	„	..	..	37·6 „
20 „ 30	..	..	..	7·5	„	..	..	34·2 „
30 „ 40	..	..	..	6·0	„	..	..	35·7 „
40 „ 50	..	..	..	15·0	„	..	..	31·5 „
50 „ 60	..	..	..	8·3	„	..	..	47·6 „
60 „ 70	..	..	..	33·0	„	..	..	0·0 „
70 „ 80	..	..	..	0·0	„	..	..	20·0 „

Those who had been vaccinated within ten years were attacked to a moderate extent only, those vaccinated within five years to a very small extent, as is shown in the following table:—

Period since vaccination	Number of cases	Number of deaths
Over 10 years .. .. .	1,345	98
6 to 10 „ .. .. .	161	14
5 „ .. .. .	33	2
4 „ .. .. .	22	0
3 „ .. .. .	21	2
2 „ .. .. .	18	0
1 „ .. .. .	7	0

The mortality was less in patients with the largest number of vaccination marks.

Infants could be vaccinated without bad effects as early as the fifth to tenth day after birth. Newly-born infants were found to have acquired immunity from vaccination of the mothers before birth; but the immunity was slight and lasted a short time only.

Oposonin tests were made and led the author to the conclusion that streptococci played a part in the course of the disease; and that Wright's vaccine therapy and anti-streptococcus serum were of value in treating complications and secondary infections. Treatment with atoxyl and "trypanrot" had no marked results.

W. G. M.

**Amendments of Field Medical Regulations and Stretcher-bearer Regulations of the German Army.**—Amendments dated January 27th, 1907, and May 15th, 1907, have been issued in consequence of the issue of new field service regulations, instructions for supply and transport, and other changes in organisation and equipment.

In the *Deutsche Militärärztliche Zeitschrift* of July 5, 1907, Stabsarzt Dr. G. Schmidt gives a summary of these amendments:—

Amongst other changes is a change in the composition of the bearer company. The two buglers (see "Handbook of Medical Services of Foreign Armies," Part II., Appendix I., v. (2).), disappear. Two cooks and two mounted trumpeters are added. A field (travelling) kitchen, two-horsed vehicle, with driver, is also added to the bearer company transport. A mincing machine is included in this kitchen for mincing freshly killed meat; experiments having proved that by mincing freshly killed meat objectionable toughness is not noticed.

In addition to the auxiliary ambulance trains made up of empty goods vans and supplied with an indefinite *personnel* from the lines of communication, permanent auxiliary trains are to be formed in the home territory, the equipment for which is to be maintained during peace at certain suitable places. The number of cars and the establishment of these trains are definitely fixed.

A skilled dentist's assistant is to be included in the subordinate establishment of the clearing hospital detachment to help the dentist of the detachment (see Appendix I., vi., 4, of "Handbook of Medical Services of Foreign Armies," Part II.). Some of the medical officers, subordinate *personnel* of the medical corps, and sick attendants of this unit are to be trained in the care of patients suffering from mental disease.

A special veterinary section is added to the advanced *dépôt* of medical stores and base stores *dépôt* under a staff apothecary.

In accordance with the requirements of the Geneva Convention of 1906, instructions are introduced into the field medical regulations for

identifying the dead, for collection of articles belonging to them, and for sending information regarding wounded prisoners of war.

¶ With regard to the stretcher-bearer regulations, which are the equivalent of the British "Royal Army Medical Corps Training," the men will amongst other exercises be practised not only in loading, but also in preparing ambulance trains. They will also do revolver practice.

A certain number of the *tentes abri* of the stretcher-bearers will be used in the field as a first shelter for wounded.

The non-commissioned officers of stretcher-bearers (as well as all non-commissioned officers and men of the medical corps on the field hospital establishment) are to be equipped with infantry side-arms with saw back and to carry them during peace training. This is considered a valuable addition, as it will be of great help in improvisation.

W. G. M.

**The Bacteriology of the Blood in Convalescence from Typhoid Fever.** (By Warren Coleman, M.D., and B. H. Buxton, M.D., *Journal of Medical Research*, July, 1909.)

*Summary.*—With the additional facts which this study has placed at our disposal, we would suggest the following elaboration of our original theory—that the atrium of infection is the lymphatic structures of the intestinal wall. Thence the bacilli invade the general lymphatic system and spleen, where they grow chiefly, and where relatively few bacilli are destroyed. A limited number of bacilli may filter through into the blood during the incubation period of the disease. When the development of the bacilli has reached a certain grade they overflow in quantity into the blood, where they are destroyed and their endotoxins set free, and the symptoms represent the reaction on the part of the host. As the disease advances, if the patient is making a successful fight, the growth of the bacilli in the organs is gradually brought under control by the immunity processes, fewer bacilli are discharged into the blood, and the symptoms lessen in severity. In fatal cases, when death is not due to an accident, as hæmorrhage, the growth of bacilli in the organs proceeds unchecked and the symptoms remain of the same, or take on increased intensity.

At or about the time of defervescence the bacilli practically disappear from the blood. Though a few may filter through into the blood, the symptoms come to an end and convalescence proceeds normally. In cases in which an intermittent temperature, which is not due to a complication, continues after the original febrile movement is at an end, it is not unlikely that the growth of bacilli in the organs has not been completely checked, and that a limited number continue to be discharged into the blood. In some cases of typhoid fever the spleen remains enlarged after defervescence, and later a relapse occurs. This enlargement suggests that though the growth of bacilli, both here and in the lymph nodes, has temporarily been brought under control, complete immunity has not been established; and later, through agencies which are still unknown, rapid multiplication occurs, the bacilli are discharged into the blood, are destroyed, and the symptoms of the relapse become manifest.

The late development of local suppurative processes, due to the typhoid bacillus, seems to indicate that recovery from an attack of typhoid fever does not confer local immunity to the bacillus.



**Filtration Experiments with *Bacillus Cholerae Suis*.** (By C. N. McBryde, M.D., United States Department of Agriculture. Bureau of Animal Industry—Bulletin 113, June, 1909.)

*Summary of Results.*—When bouillon cultures of *B. cholerae suis* were filtered through the smaller Berkefeld laboratory filters it was found that after a time—that is, after a certain amount of culture had been filtered—the organisms appeared in the filtrates. With a vacuum of 20 to 25 inches of mercury not more than 100 cc. of bacteria-free filtrate could be obtained with these filters. When bouillon cultures of *B. cholerae suis* were filtered through Pasteur-Chamberland filters (F and B), the organisms did not appear in the filtrates in a single instance, although as much as 600 cc. of culture was filtered in one instance. With a vacuum of 20 to 25 inches of mercury, the Pasteur-Chamberland filters (F and B) can be depended on to furnish from 500 to 600 cc. of bacteria-free filtrate from bouillon cultures of *B. cholerae suis* when the time consumed in filtration does not occupy more than two hours.

Beef broth or bouillon is apparently unaltered by passage through a Berkefeld or Pasteur-Chamberland filter, and the absence of growth in filtrates from bouillon cultures of *B. cholerae suis* cannot be explained on the supposition that filtration effects an alteration in the bouillon which renders it unfit for the growth of the organism. The addition of an equal volume of horse serum to a bouillon culture of *B. cholerae suis* did not facilitate the passage of the organisms through the Pasteur-Chamberland filter.

Rabbits were injected subcutaneously with 10 cc. of filtered culture, and other rabbits were injected intravenously and intraperitoneally with 5 cc. of filtered culture, but none of these animals showed any ill-effects from the injections. Hogs weighing from 30 to 40 lb. were injected subcutaneously with 20 cc. of filtered culture, but were not rendered sick thereby. Collodion sacs containing filtered culture were placed in the abdominal cavities of rabbits, but remained sterile.

Granules were noted in cultures of *B. cholerae suis* and in the filtrates from these cultures, but these granules did not develop in the filtrates, nor in subcultures made from these filtrates. These granules were also shown to be incapable of development in the bodies of rabbits and hogs.

**The Bacterial Integrity of Celloidin and Parchment Membranes.** (By David Duke Tod, *Journal of Infectious Diseases*, June, 1909.)

*Conclusions.*—The celloidin membrane, contrary to the accepted view of to-day, is not impervious to the passage of all bacteria. The group of intestinal bacteria, and also *B. prodigiosus* and *B. pyocyaneus*, readily pass through celloidin sacs either by growth or direct passage. The cocci—pneumococcus, staphylococcus, streptococcus—diphtheria and anthrax groups, and the *spirilla cholerae* and *metschnikowi*—do not pass through celloidin membrane. The bacterial permeability of the parchment sac is undoubtedly the same as that of the celloidin sac. The results of experiments relative to the longevity of the typhoid bacillus, as determined by the use of the celloidin or parchment sacs, require retesting because of the partial escape of the bacilli from the sac. In animal experiments with *B. typhosus*, when introduced in celloidin sacs into the peritoneal cavity, the factor of passage of the bacilli through the

celloidin membrane must be considered in interpreting results. This is very probably true for all members of the intestinal group.

**Ein neues Verfahren zum Nachweise und zur Differential diagnose der Typhus bakterien mittels Melachitgrün Safranin, Reinblau Nährböden** (A New Method for the Recognition and Differential Diagnosis of *Bacillus typhosus* by means of the Malachite Green, Safranin, Pure Blue Culture Media). (By Loeffler, Walter, Dibbett and Wehrolin. *Deutsch med. Woch.*, No. 30, July 29th, 1909.)

In this article the authors describe new media for the isolation and differentiation of intestinal bacteria. For the isolation of *B. typhosus* and allied bacteria they describe two new agar media, differing only in the nature of the blue colouring ingredients. These media are made as follows:—

To make the agar they take 5 litres of broth, add 150 grammes of agar, dissolve and neutralise with sodium carbonate, using litmus paper as the indicator, and add 25 cc. of normal soda solution. They then add 50 grammes of nutrose dissolved in 500 cc. of warm water. To 100 cc. of this agar they add: (1) In the azo-blue medium, 3 cc. sterilised and filtered ox-bile, 1 cc. of a 0·2 per cent. watery solution of safranin, 1 cc. of a 0·5 per cent. watery solution of azo-blue, 1·7 cc. of a 0·2 per cent. watery solution of malachite green. (2) In the pure-blue medium 3 cc. ox-bile, 1 cc. of a 2 per cent. solution of safranin, 3 cc. of a 1 per cent. solution of pure blue, 3 or 4 cc. of a 2 per cent. solution of malachite green. The second medium with the greater concentration of blue and of malachite green is the better when the typhoid bacilli are scarce in the fæces.

The media are poured in plates, and the pathological material is plated on them in the ordinary way. On these plates the typhoid colonies are of a blue colour, flat and pyramidal, with undulating edges. The agar round the colony is also bluish. After twenty-four to thirty-six hours the colonies show a singular, highly characteristic, metallic lustre. The coli colonies are of a red colour, round, moist and opaque, and the agar round about the colony has a reddish tinge.

The paratyphoid colonies are very similar to the typhoid colonies.

The second method for the differentiation of the intestinal bacteria is by means of two solutions, called by the authors the typhoid solution and the paratyphoid solution. The typhoid solution contains 2 per cent. peptone, 1 per cent. dextrose, 1 per cent. neutrose, 5 per cent. lactose, 1·5 per cent. normal alkali, and 1 per cent. of a 0·2 per cent. solution of malachite green. In the preparation of this take 800 cc. of distilled water and add 40 grammes of peptone and 20 grammes of glucose, dissolve in steriliser, then add 30 cc. of a normal alkaline solution, then 200 cc. of hot water containing 20 grammes of neutrose. Then add 100 grammes of lactose, put in flasks and sterilise. To 100 cc. of this solution add 1 cc. of a 0·2 per cent. sterilised solution of malachite green and tube in sterile test-tubes.

The paratyphoid solution is similar, but contains no glucose.

In the typhoid solution the typhoid bacillus clots the medium-like milk, and over the coagulum stands a clear green fluid. *Bacillus coli*, Paratyphoid A and paratyphoid B, and all organisms associated with food poisoning, produce in this medium, in twenty-four hours, an active

fermentation, the neutrose is precipitated in dirty flakes, and there is a green froth on the surface of the liquid. All the substances in the solution are necessary for a characteristic reaction.

In the paratyphoid solution the *B. typhosus* and the paratyphoid A produce no change. Paratyphoid B and the food-poisoning organisms decolorize it slowly. *B. coli* produces the same fermentation as in the typhoid solution.

Two other micro-organisms were found to produce the same change in the typhoid solution as that produced by the typhoid bacillus. One, called the *B. typho similis*, turned the paratyphoid solution into a milky green. The other, *B. typhosus duplex*, which is allied to, if not identical with, the paracolon bacillus precipitates the neutrose in the paratyphoid solution without fermentation of the medium.

Further differentiation of these intestinal bacilli is rendered possible by the addition of safranin and pure blue (Rein blau) to these solutions.

W. E. M.

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## Correspondence.

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### DISPOSAL OF PATIENTS SUFFERING FROM MALARIA.

TO THE EDITOR OF THE "JOURNAL OF THE ROYAL ARMY MEDICAL CORPS."

SIR,—Colonel Anderson, in the Journal for August, propounds a peculiar problem for solution by his brother officers with Indian experience. I have that experience, and if it will help him at all I should say that "it would be nothing short of manslaughter" to send a patient with the gruesome train of symptoms he details "to the hills, in the winter months," or anywhere else for that matter. Personally, in such a case, I should take a back seat and send for the chaplain.

But if he means to imply—as he does—that to send a bad malaria case to the hills instead of to England will, irrespective of ultimate military efficiency, discount the man's chances of recovery, I totally disagree with him. Your rich man in England flies from the fogs and all the climatic horrors of the motherland to the bracing uplands of Switzerland. He is quite right, and it is high time that we doctors in India recognise the fact that we have the equal of Switzerland, in climatic conditions, on the lower slopes of the Himalayas, from October to March, and that except for some forms of heart disease, the conditions are suitable for diseases such as malaria, dysentery, enteric fever, rheumatism, and tuberculosis. The fact is that Switzerland is a fashionable health resort, the Himalayas are not; both of them are infinitely preferable to England "in the winter months."

I am, &c.,

R. H. FORMAN, Colonel.

Bombay,

August 20th, 1909.

Journal  
of the  
Royal Army Medical Corps.

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Original Communications.

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MEDICAL HISTORY OF THE SOUTH AFRICAN WAR.  
THE INCIDENCE OF DISEASE AMONG THE CIVIL POPULATION OF  
SOUTH AFRICA PRIOR TO THE WAR, AND CONDITIONS ASSO-  
CIATED WITH THAT INCIDENCE.

BY LIEUTENANT-COLONEL R. J. S. SIMPSON, C.M.G.  
*Royal Army Medical Corps.*

I. GENERAL CONDITIONS.

1. INTRODUCTION.—Sanitation in South Africa was in a very backward condition, the inevitable consequence of the various factors which influenced its recent history. Until the discovery of the diamond fields and, later, of the gold fields of the Rand, communication with South Africa was slow and infrequent; there were few immigrants but those in search of health or of a problematical fortune. The predominant influence was in the hands of the "Dutch" population, descendants of the Dutch or Huguenot settlers of the sixteenth and seventeenth centuries, retaining most of the habits and customs which their forefathers introduced with them when they first landed. As in India before the Mutiny, the white community, so much in contact with the natives and so dependent on them, conformed in some degree to their customs.

Again, the last century was one of great expansion in the various territories of South Africa; pioneers pushed out on every side, and in many of the towns of the Transvaal and Orange River Colony, besides northern Cape Colony, a good many of these pioneers, or their children, are still to be found. The rapid commercial develop-

ment of the country during the last years of the nineteenth century brought a large immigrant population, of whom a large number were of little benefit to the country, and many left South Africa during the war as "undesirables."

From these conditions it has resulted that the standard of sanitation in the older territories and among the majority of the population has been that of the seventeenth century somewhat depreciated by contact with the natives, while in the newer colonies the primitive methods of the pioneers have barely been improved by their replacement by the methods common in the areas from which they came.

Further, over a large part of South Africa expense has always been an obstacle in the way of progress. Natural conditions make sanitary problems more difficult than in Europe and their solution more costly, while, on the other hand, the density of population is so much less that the cost per head must always be considerably greater than in Europe.

2. PHYSICAL FEATURES.—As regards the general aspect of the area of operations, from the southern border of the Great Karroo to a line on the north from the junction of the Riet and the Modder Rivers to Aliwal North: from the west coast north of Olifants River to the Stormberg in the east, the country is mainly Karroo, or Karroo and grass, with limited areas of agriculture round the towns (such as Richmond, Victoria West, or Middelburg), and especially in the valley of the Sunday River and its tributaries. North and east of these lines the country is mainly grass veldt, but includes limited agricultural districts, such as that on the Caledon River near Ladybrand, areas on each side of the Natal Government Railway, and others encircling the larger towns. The line dividing the Karroo from the veldt is very nearly that separating the area of less than 20 inches of rain per annum from that of greater rainfall.

South of the Karroo the country is more broken and its nature less regular; barren hills and fertile valleys are interspersed with limited areas of flatter country, more particularly towards the south-east coast-line. North of the line to Delagoa Bay lies the lower "bush veldt" and "low veldt," a wilder and even less populous district than those to the south. The Krokodil Valley and the country bordering on either side are very wild, mountainous, and broken.

3. WATER SUPPLY.—Speaking generally, South Africa is not so well watered. It is a country whose permanent rivers are few

in comparison to its area; one member of the well-known chain of negative clauses used proverbially to describe it speaks of "rivers without water." But this implies the second difficulty—the temporary excess of water during the rainy season, which involves the necessity of flood channels in excess of the average requirements.

A very valuable account of the water supplies of South Africa is to be found in the report on "Irrigation in South Africa" by Sir W. Willcocks, K.C.M.G.<sup>1</sup> After pointing out that it is what it was fifty years ago, "a pastoral country importing cereals and dairy produce and even hay from foreign countries," he points out that "the reason for this want of development of the agricultural wealth of the country lies in the fact that the rainfall of the three colonies, with the exception of the extreme south-west corner, is not only erratic and uncertain at the times most opportune for sowing, but is constant and heavy in autumn." Sir W. Willcocks' report deals, of course, with water for agricultural purposes, which differs in many ways from the supply of a potable water, but even from the latter point of view the report is both interesting and valuable.

*Sources of Supply.*—(1) Surface Water. (a) From a recognised and guarded catchment area. (b) From rivers. (c) From small streams. (d) From dams.

(2) Well water. (a) Shallow. (b) Deep.

(3) Springs.

(4) Rain water.

(1) Surface Water.—(a) Capetown (including its suburbs) before the War was the only place in South Africa which drew its supply from a definite area set apart for the purpose—viz., the plateau and higher slopes of Table Mountain. This area is not indeed entirely protected, as it is open to those climbing the mountain, and a proposal to close the area completely (originating with the Sanitary Authorities, Cape Colony), met with much opposition, and would be difficult to carry out. The supply is ample and of good quality, though during the rainy season it becomes very dark from peaty matters, and when taken on board ship and stored in iron tanks assumes a very ugly colour. The water is very soft and acts rapidly on lead piping.

(b) River Water.—Many of the larger towns drew their supplies from rivers: Kimberley and Johannesburg from the Vaal; Port

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<sup>1</sup> "Further Correspondence relating to Affairs in South Africa," July, 1902, pp. 37 *et seq.*

Elizabeth from Van Sladens River ; King Williamstown from the Buffalo River ; Durban from the Umbilo and Umlaas ; Ladysmith from the Klip River. The supply at Durban was not good : it was muddy and open to pollution. The same may be said of the supply in Maritzburg ; that at Ladysmith was very bad. The others named were good supplies from comparatively large streams.

*Bloemfontein*.—The old supply was from wells. A scheme was inaugurated to replace this older supply by a supply drawn from the Modder River at Sannah's Post. The waterworks appear to have been opened in May, 1899, and part of the town was supplied with this water, but its use was not compulsory, and the older wells remained in use. Storage and filtration were imperfect. This supply was cut off by the Boers on April 3rd, 1900, and was not again available till May 10th.

*Kroonstadt*.—The supply was pumped from the Valsch River to some reservoirs at about the highest point adjacent to the town. The river was dammed below the point of intake, and above that point received all the drainage from the slopes north of the town, which were fissured with small dongas which had been used as latrines and rubbish shoots. The result was that the supply after rain was as bad as possible. There was no efficient filtration. There were also the older shallow wells in use in the lower part of the town.

(c) From smaller streams. This is a common source.

The supply is in some instances taken direct from the stream ; in other cases it is conveyed for some distance in pipes, or in an open furrow, or the two are combined, piping being used part of the way only. Protection of the catchment area is exceptional. In some instances the furrow is protected, in most it is not, and the water is therefore open to pollution of every description. In some instances the furrow or piping is used to supply secondary reservoirs or dams, from which the supply is distributed. These reservoirs are not well reported on.

(d) From dams or pans. In the more arid districts these form the only sources of supply to the smaller towns, villages, or farms. On the march across the Orange River Colony to Bloemfontein these were at times the only sources of supply. In some cases these dams are filled by furrows from a stream ; in most instances they are formed in a slight hollow in the ground to catch and retain the rainfall, which in these cases is the only source from which they are filled. Here, of course, the supply diminishes steadily by use and evaporation during the dry season. These dams

are also used for watering stock. In Cape Colony there are, in the Western Provinces, a good many large reservoirs, some, as in the Verkeerde Vale reservoir (near Touws River Station) largely fed by springs, others from the smaller streams and rivers. On the Stormberg plateau there are a large number of dams and reservoirs (see Sir W. Willcocks' report). These reservoirs are all primarily intended for agricultural purposes, but sources of this type were perforce used for drinking water during the war.

(2) *Well Water*.—Shallow wells form a common source of supply in all the colonies and are almost without exception unprotected. Those in Bloemfontein and Kroonstadt have been referred to; there were also some wells in Pretoria. All were open to contamination, and some invited it. Many of these are quite shallow, and open to soakage as well as to pollution from matters washed into them (*vide* Public Health Reports, Cape Colony).

As regards deep wells, Sir W. Willcocks points out that the extraordinary success which has attended deep bores in southwestern Queensland cannot be expected in Cape Colony, as "the subsoil water can only be very local and insignificant in quantity." He gives the result of the boring operations conducted by the Cape Colony Government since 1890 to the end of 1898 "approximately as follows"—

"Number of holes bored, 2,600.

"Successful, about five-sixths.

"Unsuccessful, about one-sixth.

"Cost of boring—per hole, £17.

"Average depth of hole, 60 feet.

"Total discharge of water, 26 cubic feet per second.

"Discharge per hole,  $\frac{3}{4}$  cubic foot *per minute* (equal to about 6,732 gallons in twenty-four hours).

"Practically all the holes need machinery of some kind to lift the water."

No information is given as to the time taken to put down these bore-holes—an important point in military work. Later this question will be dealt with in some detail.

A few bore-holes have been made in Cape Colony for the supply of drinking water, and have apparently been satisfactory. Three old (disused) bores on the commonage at Bloemfontein were opened out after our arrival there, and gave a good supply. More use has been made of similar bore-holes in recent years.

(3) *Springs*.—Springs are not uncommon as a partial supply. In some cases the water is conveyed from them by pipes or in open



furrows. In most cases there is no protection against pollution. The very excellent municipal supply in Pretoria is conveyed in pipes from springs a short distance outside the town, and distributed throughout the town.

(4) *Rain Water*.—Rain water collected from the roofs of the houses and stored in tanks is not an uncommon supply. In a few instances this forms the only source of supply (such as at Bathurst).

In most cases the total supply of a town comes from more than one source—*i.e.*, wells may supplement the supply conveyed from a distance (as in Bloemfontein, Kroonstadt, and Pretoria). Rain water is in Cape Colony not an infrequent addition to other supplies.

The Public Health Reports, Cape Colony, confirm our experience that the necessity for the provision of a pure supply, or the adequate protection of that supply when obtained, was not recognised by the local authorities, in spite of the strong recommendations of the district surgeons.

The persistent and continuous pollution of the soil in every inhabited area (which will be referred to in detail later) must be borne in mind in relation to every water supply, except from rain, deep wells, or efficiently protected areas.

4. CENTRES OF POPULATION.—Unlike the Kaffir Kraal, established on a height for security, the Dutch towns are invariably placed along the stream at the bottom of a valley. Each town is surrounded by a circle of townships and farms, the density of population diminishing towards the circumference of the circle. Hence between the areas influenced by the proximity of markets and stores are areas that are very sparsely inhabited, at least by the white population. There is a tendency to speak of these areas as virgin soil, and to assume that such disease as appeared among the troops working in these areas must have been introduced by them. Both assumptions appear to be ill-founded. There is a comparatively large native population scattered over these areas; the Kaffir is a great traveller, and the whole country is seamed with native paths leading from larger centres to the kraals, or from kraal to kraal. The importance of this lies in the probability of the extensive spread of contagion by natives returning home from the mines, a factor which had received some attention before the outbreak of the War.

The older towns are built on a good plan. Parallel streets intersect a second set at right angles, and the town ends on a

definite line of demarcation between town and veldt. The recent towns have barely escaped from the mushroom stage; their plan is the result, not of a definite intention, but of a process of accretion, and there is no uniformity in the type of buildings. A third type indeed is formed by the combination of the old town with modern excrescences. Only one feature was common to all—the absence of any definite sanitary system, including in this a satisfactory water supply as well as an efficient method for the disposal of excreta and slops. The principal sanitary defects are<sup>1</sup>:—

(a) The want of a pure water supply, as mentioned above.

(b) Imperfect methods for the disposal of excreta. There are practically only two methods in use—the old cesspool and the tub system.

Cesspools are far from uncommon; in some instances they are apparently considered less harmful because “the soil is very porous.” This is not an advantage where shallow wells are used, or indeed surface water from any source. There are many varieties of the tub system. In a few instances there is a complete system: the tubs are removed under municipal arrangements and the night soil is carted away and buried outside, at some distance from the town. In other instances the night soil is thrown into a sluit outside the town, resulting in pollution of some stream sooner or later. In other instances the removal is not paid for by a sanitary rate, but by a charge for each occasion. This tends to infrequent removals. Again, in other cases no municipal arrangement for removal exists; it is carried out by private contract. In some cases the night soil is buried close to the town, or even in gardens.

In one case at least it is only within recent years that a privy has been held by the municipality to be a necessity for each house, and for some time after that, though erected, many of these privies remained unused, especially by the “poor white.”

The common faults are: Tubs emptied at too long intervals; spilling of the contents; tubs rarely, if ever, cleaned or tarred; and great laxity in the methods of disposal of the night soil.

Special precautions as regards infectious excreta are almost unknown.

(c) Absence of latrine accommodation for the native population.

There is a large native population in every town or village, partly employed as household servants or grooms—that is, in some

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<sup>1</sup> Public Health Reports, Cape Colony, 1896.

capacity about the dwelling-houses of the white population—and partly as labourers of all classes. Some of these labourers are accommodated in the yards of the places in which they are employed, but a large population live in the native quarter, or, in many cases, in a special native location. Latrine accommodation for household servants in the premises is practically unknown; they have to go elsewhere. But in the towns public latrines for natives are not common and are in no way sufficient, nor so situated as to be within easy distance from all the houses; while, on the other hand, the native prefers the open air. In the native locations, too, accommodation is very deficient and usually entirely absent.

The site of every town is seamed with water channels, the result of the excessive rainfall concentrated during a short period of the year. Many of these are dry during the season of minimum rainfall. These channels are habitually used by the native population as latrines, while rubbish and garbage, and in some cases, as mentioned above, night soil, are deposited in them.

(d) Slop water.

There are practically only two methods of disposal: by the surface drains, or on the ground in the vicinity of the houses. In some few instances, if the householder provides a receptacle at his own expense, the local authority arranges for the emptying of the receptacle. Urine is, as a rule, disposed of like slop water proper; there is no doubt that much finds its way into the surface drains.

Every one of these imperfect methods tends to a constantly increasing pollution of the whole surface of the soil, and to the consequent contamination of all superficial sources of water supply. In addition, the constant presence of large numbers of cattle and horses tend to foul the unpaved and badly made streets.

The smaller the town or village, the worse is the sanitation, while the lowest depth is reached in the farm, where well, privy, and cattle-kraal are all closely placed together. On some farms it appears that no pretence at any sanitary convenience is made; the open veldt suffices for all purposes, and probably in some ways this is really less harmful than a more elaborate arrangement. It is not possible to say that the conditions in the native kraals are worse than those in the small outlying villages or in the native locations, but they are no better.

The important point is that throughout the whole of South Africa, at least prior to the War, wherever there was a human being there also was a persistent source of pollution both of the soil and water.

The Public Health Reports, Cape Colony, give much interesting information on these points. No report appears to have been issued between 1896 and 1903. The following extract from the report of the Medical Officer of Health, Cape Colony (Dr. Gregory), for 1903 shows that these conditions are not being overlooked by the sanitary authorities, but the difficulties in the way of amendment are very great.

The conditions in Natal differed but little from those in Cape Colony, and, though no reports are available from the Orange Free State and Transvaal, there is no doubt that in these areas also similar conditions existed, so that although the written record is fullest as regards Cape Colony, it is possible to take that as exemplifying the whole.

Extract, Report of the Medical Officer of Health, Cape Colony, 1903, p. 5:—

“(2) GENERAL SANITARY CONDITION OF THE COLONY.

“Printed with this report will be found the annual reports of district surgeons and urban local authorities of the Colony dealing with the health and sanitation of their respective districts during the past year.

“For many years it has been the custom to obtain these reports and to print them for presentation to Parliament, and I am of opinion that on the whole their preparation and publication serve in some degree to direct attention to sanitary defects, and to stimulate interest in sanitary improvement; yet I am bound to confess that they attract less notice than the importance of the subject they deal with deserves. Were they only read and digested by those responsible for the carrying out of local sanitation, much valuable knowledge would be obtained of local conditions and of the almost universal need that exists for their improvement.

“Indeed, a consideration of these reports shows how extensively many of the most fundamental matters of sanitation and the protection of the public health are neglected, chief among which are the protection of water supplies; the disposal of night soil, and refuse; the control of native locations; the prevention of overcrowding; the sanitary regulation of buildings and dwellings; the supervision of slaughtering and the sale of food, and the suppression of infectious diseases.

“Although attention is usually paid to other matters of municipal concern, it is frequently to be noticed that questions of health and sanitation are neglected. I only know of two local authorities

in the Colony which employ a medical officer devoting his whole time to the work of the district—namely, the Municipality of Cape Town and the Board of Health of Kimberley—and even the number of local authorities who retain the services of a medical officer in merely a consulting capacity are few and can be numbered on the fingers. In many cases where such officers are appointed their position is purely a nominal one and their advice is rarely sought, and, if sought, is frequently neglected. Until every urban local Authority has the advice of a competent medical officer of health and acts on that advice, it is scarcely likely that any great advance in the general sanitary condition of urban areas in the Colony will take place.”

Foodstuffs, and particularly milk, are not protected from contamination in any way. Most of the market gardening is in the hands of Malays (near Capetown) or of Indians, whose methods of enrichment leave much to be desired. The milk supply is practically not under any control; milk is mainly sold by the bottle, and the empty bottles are washed anyhow and anywhere. The milk always contains a large amount of foreign matter.

## II. THE PREVALENCE OF ZYMOTIC DISEASE.

Before the War there was no exact information as to the prevalence of disease in the civil population. Two things contributed to this: the imperfect system for the registration of the causes of death, and the absence of any notification of disease. In none of the colonies was a certificate from a qualified medical man necessary before the registration of a death. In a sparsely populated country such as South Africa, where many cases die (especially among the natives and the poor whites) without having had any medical attendance, it is not possible to make such a certificate obligatory, and even in the towns many of the entries on the register of deaths are, like a very large number of those in the districts, filled up from information received from friends or relatives without any written statement from the medical attendant, if there was one. The consequence is that many of the causes of deaths are registered under general terms, while many in which the cause is described more specifically are equally unreliable. “Fever,” or “fever and diarrhœa,” is incomplete as a diagnosis; on the other hand, numbers of deaths are shown as from “remittent fever” from districts in which malaria would appear to be unknown.

In the second place, notification of disease was non-existent. In Cape Colony a Public Health Act existed, but it appears to have

been of limited application. In the Public Health Report for 1896 is a copy of the Colonial Secretary's Memorandum to District Magistrates, No. 43, 1896, dated November 30th, 1896, showing the nature of the reports required from district surgeons. Each report is to consist of two parts: part 1 to "deal with the general health and sanitation of the district," part 2 to consist of a series of tables, as follows:—

- A. Return of zymotic disease.
- B. „ smallpox and amas.
- C. „ expenditure incurred on the suppression of smallpox.
- D. „ public vaccination.
- E. „ cases under medical treatment under part 2 of the Contagious Diseases Prevention Act (1885).
- F. „ expenditure—under that Act.
- G. „ lepers.
- H. „ persons in receipt of pauper relief.

Of these, A, B, D, and E were to be prepared by the district surgeon, the others by the resident magistrate.

As regards Table A—return of zymotic diseases—the following diseases were to be included:—

Typhoid or enteric fever.	German measles.
Diphtheria.	Chicken-pox.
Membranous croup.	Mumps.
Diarrhoea and dysentery.	Whooping-cough.
Influenza.	Epidemic cerebrospinal meningitis.
Scarlatina.	Epidemic pneumonia.
Measles.	Puerperal fever.
"And the disease variously called 'Typho-malarial fever,' 'Cape fever,' or 'African typhus.'"	

This is an extremely comprehensive list, but the value of the return is at once discounted by the following note at the head of the form, which is as follows:—

"In the absence of any notification of disease, or of registration of deaths, these numbers can of course be only approximate, but the district surgeon is requested to obtain as complete information as it lies in his power to do."

Perusal of the individual reports shows how little practical value this procedure has. This memorandum also shows that the only expenditure admissible on public-health matters was on the two lines, prevention of small-pox and limitation of contagious disease, and this agrees with one's impression that the public mind is intensely nervous about small-pox and similar disorders, while other diseases receive no attention at all. The threatened importation of plague into Natal in 1898 and the history of the epidemic in Cape Town in 1901 show the anxiety with which such diseases are

regarded, in strong contrast to the *laissez-faire* with regard to the other zymotic diseases, not of rare, but of daily occurrence.

It is only just, however, to add that the district surgeons were in favour of compulsory notification of disease, and many of them write strongly on the fact that they had no power in public-health matters, and that their recommendations were ignored by the local authority. One gentleman (Carnarvon, 1896) points out that "as the law of the Colony is at present, the district surgeon is prevented from being a member of the respective Town Council." Another (Hay, 1896) states under "Public Health Duties": "(e) The pointing out of numerous 'abuses,' some of the most serious nature, as affecting the water supply, to the local authority, but nothing has been done, and, unfortunately, district surgeons are powerless;" and, further, "(8) There is great need for a good workable Public Health Act, which would give the central health authorities power to compel, where necessary, erring local authorities to do their duty. Until such an Act is on the Statute-book, local authorities—more especially in the case of small country towns, where local prejudices and influence rule the day—will do nothing, at least as far as my experience teaches me, generally falling into an apathetic state, usually about one month after they have been 'duly appointed and gazetted.' As far as this town is concerned, it would appear that, owing to some legal defect, the rules of the Village Management Board cannot be enforced, and, as far as I am aware, no steps have been taken to put matters on a better footing; and so we go on from bad to worse from year to year, each one being a law unto himself, and even the most elementary rules of sanitation not being observed. *Diarrhœa and other gastro-enteric affections are, from year to year, becoming more and more prevalent, and more and more of a fatal type.*<sup>1</sup> This, I have not the very least doubt, is in a very great measure due to the water supply being so grossly contaminated; what with open water-furrows, numerous cess-pits, and the dirty habits of many of the inhabitants, &c., &c., it would indeed be very strange if it were otherwise."

In Cape Colony a Public Health Act existed, but, as will be gathered from the above, of very limited scope. In Natal no Public Health Act was even on the Statute-book, district surgeons rendered annual reports, but on even more general lines than in Cape Colony.<sup>2</sup>

<sup>1</sup> These words are not in italics in the original, but deserve special attention.

<sup>2</sup> A "Public Health Amendment Act" was promulgated in Cape Colony in 1897, but had not time to be of any use before the War.

In some of the larger towns—Cape Town, Kimberley, Durban, Maritzburg, and possibly a few others, a medical officer of health for the city, and in Cape Colony also for the Colony, was appointed, but without those statutory powers which alone render such an appointment of any practical value. There were port medical officers at Cape Town, Durban, &c.

The result of such a system became evident when plague appeared in South Africa. The condition of Cape Town itself appears to have come as a surprise to the local authority (*British Medical Journal*, 1901, p. 786), a striking example of the deficiency of the sanitary sense in South Africa. And yet in Cape Town some effort had been made to ascertain the prevalence of such diseases as enteric fever and infantile diarrhoea, which are reported on in the Public Health for 1896. Some efforts had also been made to improve the more glaring defects; a drainage scheme of considerable magnitude was in progress, and an excellent water supply had been provided and was carefully watched.

The other coast ports were little, if at all, better in general condition, while the water supply of Cape Town is probably not equalled elsewhere.

Of the up-country towns, Kimberley appears to have been the only one in which a constant endeavour was made to maintain a satisfactory state of things. There was, however, much enteric fever there. Sanitary organisation in the Orange Free State and Transvaal was even less efficient. No Public Health Acts or other legal provision existed, and it does not appear that the district surgeons or their equivalents rendered any systematic reports.

But what information is available shows conclusively the constant presence among the white and coloured population of the four states concerned of enteric fever, dysentery, and—in Cape Colony—diphtheria.

The following extract from the report of the Medical Officer of Health, Cape Colony, for 1903 (Dr. Gregory) shows very well the importance of enteric fever there :—

#### “(6) ENTERIC FEVER.

“Setting aside tuberculosis, probably enteric fever is the most serious of the diseases, due to specific organisms, that prevail in South Africa. This disease constitutes a veritable scourge in many parts of the Colony. To how large an extent it prevails it is difficult to say, inasmuch as, owing to defective notification, our records are



incomplete, and, moreover, there is no doubt that large numbers of cases occur which are never diagnosed, or, indeed, ever come under observation.

“Enteric fever is essentially a disease of uncleanness and bad sanitation, and its prevalence is therefore a forcible indication of the extent to which these matters are neglected in this Colony. During the year 1903 many outbreaks of typhoid occurred in many districts of the Colony, in fact in all with the exception of twenty; 1,785 cases were notified to the Medical Officer of Health, under the provisions of the 29th section of the Public Health Amendment Act. Of these, 1,131 were Europeans, and 654 coloured; this disproportion between Europeans and coloured clearly indicates that cases among the latter are not being reported.

*“Mortality from the Disease.*

“Unfortunately the statistics of deaths registered during the year 1903 are not yet available, but a consideration of those for the calendar year 1902 will equally serve the purpose of showing the extent to which this disease prevails in the Colony.

“During that year in the thirty-five chief towns of the Colony the population, calculated on the basis of the two last censuses, 1891 and 1904, was 388,875, of which 209,146 were Europeans, and 179,729 were natives and coloured.

“During the year 343 deaths from enteric occurred, 136 being among Europeans and 207 among coloured. These figures give a rate of mortality of 6·50 per 10,000 for Europeans, and 11·52 for coloured, or of 8·82 per 10,000 for all races.

“These figures may be compared with those obtaining in England and Wales, which during the decennial period 1881-1890, amounted in the case of all ‘fevers’ to 2·35 per 10,000, the mortality for enteric fever alone being only 1·96 per 10,000.

“Every case of enteric fever has its origin in some previous case of the disease, and the manner in which it is spread may be taken as being one or the other of the following :—

“(a) Contaminated water.

“(b) Contaminated milk.

“(c) Commensal infection of persons living in the same house, owing to want of care and cleanliness in dealing with the excreta and discharges from an infected person in the house.

“(d) From excreta and other infected matters conveyed by flies or dust.

"Of these methods of spread, probably that of polluted water is the commonest. It is true that in this Colony we do not often see widespread outbreaks of the disease due to polluted water, but this may arise from the fact that in many communities a large percentage of the inhabitants have at some time of their lives suffered from this disease, so that a large portion of them must be more or less immunised against its invasion and able to withstand its attacks. For there are many places in the Colony which, although small communities, are practically never without cases of the disease."

Dr. Gregory gives particulars of two "typical outbreaks" of water-borne disease, and further examples may be found in the text of the reports from district surgeons.

There is little information regarding the prevalence in the Dutch Colonies, but Bloemfontein, Harrismith, and Johannesburg had become notorious on account of the prevalence of enteric fever, and it undoubtedly occurred to a considerable extent throughout both these colonies, while there is evidence of a considerable increase in prevalence during recent years. There is no evidence to show that the prevalence in the Dutch was in any degree less than in the English colonies, concerning which more information is available, while the conditions were similar. Johannesburg was credited with being the centre from which natives disseminated enteric fever and dysentery throughout South Africa, but the conditions were rather exceptional and cannot be taken as indicating the general state throughout the Transvaal.

The incidence of enteric fever and its death-rate in proportion to the population cannot be obtained. Inspection of the registers of deaths in some cases, and examination of the records of civil hospitals in others, show in these individual instances that the recorded incidence is smaller than might have been expected. But, as has been shown above, the registry of deaths is not to be depended on,<sup>1</sup> while hospital records deal only with a limited number of the cases that do occur.

But, after all, the important point in this connection is that a large number of cases of enteric fever did occur year after year in every district of the four colonies, and that the conditions were such as to produce a constant specific infection of the area in which the cases occurred, with a probability of wider dissemination of the contagion.

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<sup>1</sup> Tabulated statements of the number of cases in various towns are for this reason of very little value.

The comparison of the incidence of enteric fever in the Boer population with that among the English troops is a separate question—one of much interest from an academic standpoint, but to which only a partial answer can be given. Such imperfect information as we have suggests that the incidence of enteric fever before the War among the permanent inhabitants of South Africa, and probably especially among the Boers, was considerably less than among the English garrison. Probably this is a special case of what appears to be a general rule, that the recorded incidence among the natives of a country in which enteric fever is endemic is less than among immigrants into that country. This rule may, of course, only be an expression of our ignorance regarding the actual incidence among the aforesaid natives, in whom larval forms will usually escape observation.

But under war conditions the incidence among the Boers in the early stages of the War was much increased. Whether it equalled or even approached the incidence among our troops cannot be said. But there is no doubt that they suffered severely in their own laagers at Magersfontein, Paardeberg, and elsewhere, in places where, as a body, they were the first occupants of the ground.

At Magersfontein enteric fever appears to have broken out among the Boers about the same time that it appeared in the garrison at Kimberley and in Lord Methuen's force at Modder River, while a severe epidemic occurred among the prisoners at Simonstown (apparently the result of infection in the laager at Paardeberg, which was synchronous with the beginning of the epidemic in Bloemfontein). But at later periods the Boers appear to have suffered from enteric fever to a smaller extent than our troops. This was probably attributable to several factors: first, that those most susceptible were attacked in the earlier stages; secondly, that their reinforcements were almost entirely drawn from the South African colonies; and, lastly, that they were aggregated in smaller masses, and occupied the same positions for a much shorter time.

Except during these war periods dysentery of a bacillary type has not been of importance in the medical history of South Africa. It was, as a rule, mild and amenable to treatment, though differing from the acute dysentery of India, in that ipecacuanha had but little effect. Nor was it commonly followed by hepatic complications.

Malarial fevers are prevalent in the low coast-belt of Natal, the "Bushveldt" of the Northern Transvaal, and to a less extent in the Western Transvaal towards the Limpopo, in the De Kaap

Valley at Barberton, and more particularly in the Krokodil Valley, especially at Komati Poort, where their extreme prevalence was to some extent due to the very unsatisfactory sanitary conditions prevailing there. Deaths from remittent fever or from "typho-malarial" fever are reported from various parts of Cape Colony. At Graaff Reinet in 1896 forty-five deaths were reported from remittent fever, which was said to be "epidemic as in other years." It is important to note that no mention of enteric fever is made in this report. At East London "typho-malarial" fever is reported as common on the "West Bank." One is prepared to admit that an occasional death from malarial fever contracted elsewhere (Zululand, Portuguese East Africa, &c.) may occur, but there is absolutely no evidence that malarial fever of a severe type exists anywhere in Cape Colony. One can only conclude that here, as elsewhere, the diagnosis of remittent fever has been made where the disease was enteric fever. In this connection an article in *The Journal of the American Medical Association* of January 9th, 1904, by Dr. J. S. Fulton, M.D., is most important as showing that the so-called mortality from malarial fever in the Southern States of America is in fact due to enteric fever.

Certain so-called "anomalous" forms of fever prevail throughout the country. These are variously named; "Typho-malarial" fever, "Cape fever," and "South African typhus" are apparently taken as synonymous (*vide supra*). We have also "Kimberley fever," "camp fever," and, generally, "low fever." Some of the cases of Kimberley or camp fever would appear to be in fact Mediterranean fever, which has also been recognised at Phillipolis in the Orange River Colony (*vide* articles by Lieutenant-Colonel Birt in the JOURNAL OF THE ROYAL ARMY MEDICAL CORPS). "Typho-malarial" fever, it may be assumed, is invariably enteric fever, although not of a classical type. The others are in our nomenclature usually grouped under the unsatisfactory heading of "simple continued fever." No doubt they include many of the milder forms of enteric fever, and cases of paratyphoid; besides indeterminate febrile affections, some possibly of no specific origin. But it would appear that these forms of mild, usually non-fatal fevers offer a promising field for investigation.

Pneumonia is occasionally prevalent, and at times in epidemic form, especially on the higher veldt, as at Kimberley, where it was attributed to dust. One finds, however, that cases of "pneumotyphoid" are reported from various centres, so that here again is a way in which the true incidence of enteric fever is obscured.

Pneumonia has not been common among the garrison of South Africa, which, however, was stationed at lower altitudes than those in which this disease has usually been observed.

The important facts with regard to the sanitary condition of the area of operation during the late War are then :—

- (1) The general sanitation of the whole area was extremely bad.
- (2) Enteric fever and dysentery were endemic throughout the whole area.

### III. CLIMATIC CONDITIONS.

(a) *Barometric Pressure.*—The variations in this due to meteorological conditions are slight, and need no remark. But the lowered pressure due to altitude was believed by many to have some influence on the health. The area of operations (except during the later period in Cape Colony) was over 3,000 ft. above the sea level as a minimum, and indeed the greater part was over 4,000 ft., rising in the Eastern Transvaal at Belfast to over 5,000 ft. above the sea. Even under peace conditions the high altitude was blamed, probably unjustly, as a cause of cardiac irritability, especially as combined with the stimulating effects of the climate (not forgetting other stimulants—alcohol and tea or coffee), and it was the habit of those dwellers on the high veldt who could afford it to spend part at least of the hot season in the moister and more soothing climate of the coast of the Cape Peninsula, and the spring and autumn on the Natal coast. There was undoubtedly a good deal of cardiac irritability and of palpitation among the troops during our operations on the higher areas, but there were, in addition to the altitude, the fatigues and privations of war which cannot be separated from the effects of altitude.

*Temperature.*<sup>1</sup>—Away from the coast-belt the extreme temperatures, both annual and diurnal, vary considerably. In January, the hottest month, the isotherms form a wonderfully regular system of concentric ellipses, whose major axis is situated at a little more than 24° east longitude, inclined slightly from east to west. In this month the isotherm of 92·5° runs from the Vaal at 24° east longitude (its most southerly point) slightly to the west of Kimberley, and through the west of the Orange Free State and the Transvaal. The isotherm of 90° runs parallel to the former at a distance of about 100 miles, and the three following isotherms, those of 87·5°, 85·0°, and 82·5°, run also parallel, but at diminishing dis-

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<sup>1</sup> From Dr. Buchan's maps in Bartholomew's Meteorological Atlas.

tances. Practically the whole of the area of operations in the Transvaal and Orange Free State, northern Cape Colony, and northern Natal is included between the January isotherm of  $92.5^{\circ}$  and  $82.5^{\circ}$ .

In February the isotherm of  $92.5^{\circ}$  has receded to the north, the distances between the next three isotherms have increased, while the isotherms further south have become more crowded together. But the general parallelism is maintained, while in the later months the diminution in temperature from the central area towards the coast becomes more irregular, though the narrow and fairly regular ellipse of the January isotherms is still represented by a flatter and less regular elliptical formation whose major axis has shifted further east.

July is the coldest month; here the isotherm of  $70.5^{\circ}$  passes slightly to the south of Johannesburg, that of  $70^{\circ}$  to the north of Kroonstadt, and slopes gradually north-east to pass to the north of Komati Poort, while to the south of this line the temperature gradually falls, but irregularly, to the coast, where the lowest isotherm, that of  $55^{\circ}$ , cuts off the western coast provinces, including the Cape Peninsula, from the rest of the Colony.

Putting this more generally, the annual isotherm of  $83.5^{\circ}$  passes from a little to the north of Vryburg to a little to the south of Johannesburg, and from that point passes to the north-east, leaving Lydenburg outside it. The annual isotherm of  $72.5^{\circ}$  follows the Rogge Veldt and Nieuwveldt ranges eastward along the Winterberg to the Stormberg range, and thence sweeps north-east through the eastern provinces and Natal to the south of Maritzburg.

From the above general statement it will be seen that the average temperature over the area in which the troops were working was sufficiently elevated to render active operations somewhat arduous during the hot season. Further, there is very little cloud, and the actual sun heat is considerably in excess of that represented by the figures quoted above. This of course applies most strongly to the upland continental climate, where the sudden fall of temperature after sunset is very marked, especially during the cold season, and the intermediate stages between it and the beginning or end of the hot weather. Unless some precaution in the way of additional clothing is possible, this sudden change is likely to give rise to a chill.

On the open veldt there is usually some little breeze which tempers the heat, but in the valleys, especially during the rainy season, the heat is oppressive, and the fall of temperature at night

much less marked. In Pretoria, the difference even of 200 feet between the town and the hospital camp on the veldt to the east made an appreciable difference in the temperature.

*Wind and Dust.*—Even the strongest advocates of South Africa as the health resort for each and every disease confess that the dust is a great objection. In the cold season anti-cyclonic conditions prevail over the high ground of the Orange River Colony and Transvaal, and the winds are gentle and without much lifting power. Hence the dust is mainly that due to traffic, which is carried up slowly into the air to form a persistent haze, but does not travel far. In the hot season the opposite is the case: the prevailing barometric pressure is lower over the higher areas, the weather is less settled, and the wind tends to blow in gusts, and at an angle with the ground. The result is that every place where the surface of the soil is soft and loose supplies its quantum of dust, and in a really good dust-storm even comparatively large particles of grit are carried with sufficient force to be unpleasantly felt on the face and neck. The distance to which the smaller particles may be carried is probably considerable, but such a storm is usually followed by rain, which clears the air, so that the effective radius of a dust-storm for the conveyance of infective material must be influenced by the violence of the wind and the angle it makes with the ground, together with the interval between its passage over the infected area and the time when the rain falls at any other place in its onward track, which is somewhat cyclonic.

(d) *Rainfall.*—The Cape of Good Hope Meteorological Commission Report for 1897 contains a very full discussion of the rainfall of South Africa between 1885 and 1894 by Dr. Alexander Buchan, M.A., LL.D., F.R.S.E., and a map by Mr. Struben showing the distribution of the summer and winter rains, besides a series of diagrams showing the distribution of the rainfall throughout the year in representative districts, mainly of Cape Colony.

It is sufficient to indicate generally the amounts of the total annual rainfall over the area of operations. To the east of a sinuous line running from near Grahamstown through Cradock and to the east of Colesberg to Kimberley and Vryburg, the annual rainfall is over 20 inches. A second more strongly curved line encircling the south-western border of Basutoland, sweeping through the Orange River Colony about midway between Bloemfontein and Ladybrand, Kroonstadt and Harrismith, turns to the west of Johannesburg, and thence passes at a sharp angle to the eastward between Johannesburg and Pretoria. To the east of this

line the annual rainfall is between 30 and 40 inches ; that is, over the greater part of the theatre of war the rainfall was at least 30 inches per annum.

In connection with this, the seasonal distribution has to be taken into account. Turning to Mr. Struben's map, we find that the line along which the rainfall during the summer months, October to March, is approximately equal to that of the winter months, April to September, runs from near Ladysmith, Cape Colony, northwards as far as Fraserburg and then turns north-west. From the same starting point, it runs almost due east to reach the coast north of Port Elizabeth. To the north and east of this line the proportion of rain that falls during the summer is greater than that during the winter ; to the south and west the converse occurs. A line of the same general shape with its angle about Fraserburg Road Station marks off an area to the north and east in which over 70 per cent. of the total annual rainfall occurs during the summer months, and it was in this area that our troops were mainly employed.

*(To be continued.)*

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# AN INVESTIGATION OF SORE THROATS AND TONSILLITIS OCCURRING IN MEN OF THE REGULAR ARMY.

BY LIEUTENANT-COLONEL R. J. S. SIMPSON, C.M.G., CAPTAIN L. W. HARRISON

AND

CAPTAIN J. C. KENNEDY.  
*Royal Army Medical Corps.*

## INTRODUCTION.

IN his inspection report for 1907, the Inspector of Medical Services drew attention to the prevalence of sore throat and tonsillitis amongst the men of the regular army, and requested that an expert enquiry should be made. The matter was referred to the Army Medical Advisory Board, who deputed the Pathological Sub-Committee to conduct an investigation. After some discussion the Sub-Committee decided that the enquiry should be divided into two parts:—

(a) A study of the figures and spot maps from nine different stations.

(b) A bacteriological examination of sore throats and tonsillitis, special attention being directed to streptococci.

For the statistical branch of the enquiry the War Office supplied the annual admission rates of the two diseases, separately, for the stations Colchester, Aldershot, London, Curragh, Plymouth, Woolwich, Dublin, Portsmouth, and Chatham, during the period 1898-1907. The same stations also furnished spot maps showing the beds occupied by cases of sore throat and tonsillitis during the period, November 1908, to May, 1909.

Lieutenant-Colonel Simpson, a member of the Sub-Committee, was then requested to make a critical examination of the figures and maps so obtained and the results of his enquiry may be summarised as follows:—

(1) There is a distinct grouping of the stations observed, according to average prevalence, which may probably be explained by climatic differences, or at least may have some light thrown on it by the seasonal distribution of these diseases in relation to climate, which has yet to be worked out.

(2) The spot maps show definitely that infection from case to case does not occur.

As regards the bacteriological examination it was decided to make a study of the streptococci occurring in the throat of (a) the

healthy soldier, and (b) the soldier when suffering from sore throat and tonsillitis. This part of the investigation was undertaken by Captain L. W. Harrison and Captain J. C. Kennedy. From the reports furnished by these officers it is evident that there is no group of reactions which will serve to distinguish the streptococci occurring in the normal throat from those present in sore throat and tonsillitis. Both officers comment on the inconstancy of the "sugar reactions" which have been employed to separate the streptococci into groups.

# STATISTICAL REPORT ON SORE THROAT AND TONSILLITIS.

BY LIEUTENANT-COLONEL R. J. S. SIMPSON, C.M.G.

*Royal Army Medical Corps.*

## I. PREVALENCE.

(1) Annual admission rates for the two diseases separately were supplied for the period 1898-1907, relating to the following nine stations: Colchester, Aldershot, Portsmouth, London, Curragh, Plymouth, Woolwich, Dublin, Chatham.

(2) Distribution of the two diseases combined. The separation of the two diseases seemed unnecessary in view of the known confusion in diagnosis.

Examination showed that these stations group themselves in two series of different degrees of prevalence as follows:—

<i>Group A.</i>									
Station	Average annual incidence				Actual difference			Probable difference	
Chatham ... ..	78·10	p.e. 3·73	...	...	—	...	...	...	—
Woolwich ... ..	77·64	5·94	...	...	0·46	...	...	...	7·01
London ... ..	77·38	3·14	...	...	0·26	...	...	...	6·72
Colchester ... ..	74·47	3·59	...	...	2·91	...	...	...	4·77
Aldershot ... ..	72·80	4·54	...	...	1·67	...	...	...	5·79
Dublin ... ..	67·37	3·89	...	...	5·43	...	...	...	5·98
<i>Group B.</i>									
Portsmouth ... ..	48·50	3·72	...	...	18·87	...	...	...	5·38
Plymouth ... ..	45·49	1·87	...	...	3·01	...	...	...	4·16
Curragh ... ..	43·18	2·70	...	...	2·31	...	...	...	3·28

Within Group A, the actual difference between Chatham and Dublin is 10·73, the probable difference is 6·56. In Group B, the actual difference between Portsmouth and the Curragh is 5·32, the probable difference is 5·38. A difference to be significant must be rather greater than twice the probable difference. In this table, this occurs only between Dublin and Portsmouth, separating the two groups, in each of which on the other hand no essential difference in incidence occurs.

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No reason for this difference between the groups has been observed, one may however note that in Group A all the stations are inland; in B, two are on the coast, and one is an open area.

(3) Variability from year to year. The percentage variation is as follows:—

London ...	19·01	Colchester ...	22·60	Curragh ...	29·29
Plymouth ...	19·29	Dublin ...	27·08	Woolwich ...	35·89
Chatham... ..	22·37	Aldershot ...	29·27	Portsmouth ...	35·94

This variability has to be read in conjunction with the average incidence. For instance, London has a high average incidence and a small annual variation, that is the high incidence rate is not occasioned by occasional severe epidemics, but by an endemic prevalence of some degree of severity. Plymouth on the other hand shows a small endemic prevalence with little liability to epidemics. Portsmouth shows the converse in having a small average incidence with a high variability, or it has more periods of small prevalence than Plymouth, with which it is grouped. The other stations occupy intermediate positions in both respects.

(4) Relation of sore throat plus tonsillitis to influenza. Taking the ninety observations (nine stations for ten years each), the figures show a considerable correlation, the coefficient being  $\cdot 3091 + \cdot 064$ . The series for the incidence of influenza for the same ten years is as follows, where all the particulars are shown together.

Station	Average annual incidence		Variability		Coefficient of correlation	
Woolwich ... ..	29·74	p.e. 3·96	62·39%	...	·8066	p.e. ·0374
Colchester ... ..	25·96	3·71	67·05	...	·5440	·1501
London ... ..	24·91	2·19	41·31	...	·1161	·2104
Aldershot ... ..	23·99	3·38	65·98	...	·6402	·1209
Plymouth ... ..	22·96	3·23	66·01	...	·4736	·1654
Curragh ... ..	22·01	2·27	57·92	...	·3248	·1907
Chatham ... ..	21·59	4·44	97·41	...	·4531	·1695
Chatham (9 years) ...	15·11	1·90	56·05	...	·3673	·1990
Dublin ... ..	15·25	1·48	45·61	...	·2749	·1973
Portsmouth ... ..	12·57	1·83	68·28	...	·0163	·2132

NOTE.—Chatham (9 years) omits 1904, an epidemic year outside the limits.

Of these, Portsmouth is the only station which can be distinguished from the others in annual incidence; the remainder must for all practical purposes form one group.

In the following stations the coefficient of correlation is positive and significant: Woolwich, Colchester, Aldershot, Plymouth, Chatham (nine years) (?), Curragh. In Chatham (ten years), it is negative and significant.

In the following the correlation is doubtful: London, Portsmouth, Dublin (?), Curragh.

The coefficient of correlation indicates the way in which the increase or decrease in the two diseases (sore throat plus tonsillitis) and influenza agrees; if there is absolute agreement, if the time and degree of the variation, plus or minus, is the same in each disease, the correlation coefficient is positive and unity; if the agreement is not absolute the coefficient measures its amount. If the movements occur on the whole simultaneously in opposite directions, the coefficient is negative.

There is then evidence that on the whole sore throat and tonsillitis, taken together, increase or decrease very much as influenza increases or decreases. Other branches of this enquiry, as well as common knowledge, suggest that part, possibly not the whole, of this relation between the two groups is adventitious, that it is in fact a result of methods of diagnosis, and not the expression of an etiological connection. The relations however are worth recording, if only to prevent more time being spent on similar work.

Infectivity. Spot maps showing the beds occupied by cases of sore throat and tonsillitis have been received from the following stations for the months November, 1908, to May, 1909:

Aldershot, Chatham, Colchester, Woolwich, Devonport, Curragh, Dublin, Caterham, Windsor and London.

The results are summarised in the following table, in which the figures in the top line show the number of cases in any group occurring in one barrack room during the month; the figures opposite the names of the months show the number of times these groups occurred (frequencies); the actual number of cases is of course obtained by multiplying the top figures by the frequency.

Month	SORE-THROAT				TONSILLITIS				Total
	(1)	(2)	(3)	Total	(1)	(2)	(3)	(4)	
November ...	56	1	—	58	139	12	—	—	163
December ...	48	4	—	56	95	2	1	1	106
January ...	54	2	—	58	163	9	1	1	188
February ...	104	5	1	117	204	18	2	1	250
March ...	164	15	1	197	273	21	1	0	318
April ...	101	3	—	107	197	10	2	—	223
May ...	81	6	—	93	153	13	2	—	185
Group totals...	608	36	2	686	1,224	85	9	3	1,433
Per cent. total cases	88.63	10.50	0.87	100	85.41	11.86	1.88	0.83	100

The striking feature is the enormous preponderance of single case groups; practically 89 per cent. of the total in the case of

sore throat, and 85 per cent. in tonsillitis. Owing to the artificial division by months, these percentages are probably a little too high, as, if two cases occurred in one barrack room, one at the end of a month and the second at the beginning of the next, they would appear as two single cases, whereas if they both occurred in the same month they would form a (2) group. The error cannot be large, and is probably counterbalanced by the occurrence of groups of cases in the same room during the month, but separated by an interval which is too long to admit of any real connection between the cases.

There is little variation in the proportion of cases in the groups in the two diseases, 88·63 and 85·41; 10·50 and 11·86; 0·87 and 1·88 respectively, but the tendency is slightly towards the formation of higher groups in tonsillitis than in sore throat.

The evidence against any special infectivity from case to case appears conclusive, the more so that it can be seen in going through the maps that groups as distinguished from individual cases occur practically exclusively where and when the general prevalence is considerable, that these groups are probably accidental in origin, and their constituent cases unrelated in origin.

Specific infection of barrack rooms has not been dealt with so far. It requires the reconstruction of one set of maps from the whole, an operation demanding much time and labour, which in view of the evidence afforded by other parts of this enquiry would appear to be unnecessary.

The Officer Commanding Connaught Hospital, Aldershot, has noted opposite each case the condition of the mouth as regards sepsis and dental caries, and whether the patient was a smoker or not. It has been difficult to arrange the particulars so given in such a way as to give numerical results, as the notes are not always expressed in the same fashion from month to month. But as far as it goes the evidence leads to no positive conclusion in either direction. Nor are there any controls in men not under treatment for these diseases.

Summary.—The results of the statistical branch of this enquiry are as follows:—

(1) There is a distinct grouping of the stations observed, according to average prevalence.

(2) There has been between 1898 and 1907 a definite correlation between sore throat, tonsillitis and influenza, which is however probably not etiological.

(3) The spot maps appear to show definitely that infection from case to case does not occur.

Of these three points, the first only appears to need further investigation; probably this may be explained by climatic differences, or at least may have some light thrown on it by the seasonal distribution of these diseases in relation to climate, which has yet to be worked out.

#### THE STREPTOCOCCI OF NORMAL AND OF SORE THROATS.

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A great amount of work on the subject of streptococci has been done by Dr. M. Gordon, who in 1905 published the results of his investigations into the characters of 300 streptococci isolated from the saliva of twenty-two normal persons. As a result of their behaviour in nine special media, selected from a great number as being most likely to distinguish the varying types, he arranged the 300 streptococci in eight groups containing forty-eight varieties.

Gordon's work was further elaborated by Drs. Andrewes and Horder, who in September, 1906, published the results of their investigations into the records of the reactions given by 1,200 streptococci isolated by Gordon, Houston, and themselves. As the result of their enquiry, these workers, taking into account not only the reactions given to Gordon's test media, but also other characters, such as length of chain, pathogenicity, ability to grow on gelatine at 20° C., &c., divided the streptococci definitely pathogenic or associated with disease in man into five groups, viz.: *Streptococcus pyogenes*, with thirteen variants, *S. salivarius* with thirteen variants, *S. anginosus* with twenty-five variants, *S. faecalis* with eleven variants, and pneumococci with eighteen variants, making a total of eighty-four varieties of streptococci found in these conditions.

They further claimed that the various streptococci showed a remarkable constancy in their reactions to the tests adopted, after prolonged subculture, and cases were related in which streptococci isolated from different persons, which gave identical and peculiar reactions, were traced to the same source; showing that passage through different individuals had not affected their characteristics. One may also refer to the case of a streptococcus revived after nine months incubation, which gave its original reactions when retested on these lines. It was the narrative of this remarkable constancy which stimulated the hope that perhaps a streptococcus giving a definite set of characters might be found predominating in the sore throats of men coming from the same community.

The technique I adopted with this object was as follows, both in the case of the normal and of the pathological throats.

(1) About 5 c.mm. of mucus from the tonsillar region was taken on a button-ended glass rod, which had been found to take up about this amount of mucus, as estimated by an average of a number of weighings.

(2) This amount was well mixed up in 5 cc. lemco (*i.e.*, sugar-free) broth made up exactly as recommended by Gordon.

(3) From the mixture amounts of 5 and 10 c.mm. were plated on agar and incubated for twenty-four hours at 37° C.

(4) At the end of this time the colonies were examined, fished, and in the case of the streptococci planted either into plain broth, 1 per cent. maltose broth, or on Löffler's serum, either of the two latter being used in the later stages of the enquiry, as they were found to encourage the growth of the freshly isolated streptococci better than the plain lemco broth used at first. In fishing the colonies care was taken by microscopic examination that two coalesced colonies were not touched.

(5) After twenty-four hours' incubation at 37° C. the growths were thickly planted on agar slopes, the object being to obtain as heavy a growth as possible for the later stages of the test.

(6) After incubation for a further twenty-four hours at 37° C., the resultant growth on each agar slope was emulsified with about 1 cc. of lemco broth, so as to obtain a thick emulsion, and from this the following media were inoculated, each with not less than 5 c.mm. of the emulsion: lemco broth, lemco broth with the addition of 1 per cent. of one of the following test substances advocated by Gordon, *viz.*, saccharose, lactose, raffinose, inulin, salicin, coniferin, and mannite, each of these being tinted with litmus; lemco broth with the addition of 0.5 per cent. of 1 per cent. solution of neutral red, litmus milk, and gelatin.

In some cases the surface of blood agar was inoculated with a view to testing for hæmolysis. The neutral red culture was placed under anærobic conditions. All the media, with the exception of the gelatin (which was incubated at 22° C.), were incubated at 37° C., and the reactions were noted from time to time.

Incubation was prolonged for seven days in the case of those incubated at 37° C., and for three weeks in the case of the gelatin. Regarding the procedure adopted in inoculating the various media, at first having placed the whole rack of test media on the slope and withdrawn the plugs, a quantity of the inoculating emulsion was drawn up into a sterile capillary pipette and at least the

quantity named thrown into each of the test media, except in the case of gelatin, in which a stab culture was made.

This method, though fairly rapid, was found to have the disadvantage of expending a large amount of media, incubator space, and time in the subsequent examination of the cultures for purity, &c., so I was led to adopt the following plan after ascertaining by parallel experiments that it worked equally well:—

The rack of test media was placed on the slope and the plugs were withdrawn as before, but from each in turn about 1 cc. of the test medium was drawn up into the chamber of a sterile-chambered pipette and then a small quantity of the emulsion. The medium and emulsion were mixed in the chamber of the pipette and the open capillary end of the latter was sealed in the flame. The method is given in some detail, as it would probably be found useful by other investigators, particularly when working with limited incubator space and with rather costly media, such as some of those employed in the present investigation. It was found to be much more rapid than the original method and subsequent microscopic examination of the cultures was much facilitated. In the case of the neutral red anærobic cultures, six of these at a time could be accommodated in a single Büchner's tube.

(7) For purposes of reapplication of the tests at a later date, the streptococci were subcultured on various media: broth, ascitic broth, agar (slope and stab), and on Löffler's serum. The last was found to be quite the best for keeping them alive without subculture for about three weeks.

(8) After subculture for varying periods of time, many of the streptococci were again planted on agar slopes, incubated for twenty-four hours at 37° C. and re-submitted to the tests, according to the procedure noted in 6, to test the constancy of their behaviour after subculture; 77 streptococci were isolated from the normal, and 37 from the pathological throats and tested in this manner, and the results are indicated on the accompanying table, which illustrates the following facts:—

(a) The most constant positive reaction was that to saccharose, which was fermented 161 times out of the 178 on which the streptococci were tested.

(b) The most constant negative reaction was that to mannite, which was fermented only once out of the 178 times. This closely agrees with Gordon's findings regarding the streptococci of normal saliva.

(c) No group of reactions was found to preponderate in those



TABLE I.—REACTIONS GIVEN BY STREPTOCOCCI ISOLATED FROM NINE NORMAL THROATS.

Number	Date	Morphology	Appearance of broth	Milk	Neutral red	Saccha-rose	Lactose	Raffi-nose	Inu-lin	Salicin	Coni-felin	Man-nite	Mal-tose	Nitrate broth reduced to NO <sub>2</sub>	Gela-tine	Hemo-lysis	Remarks
C.2 ..	9.7.08	Brevis to medius	Finely floccu-lent	+	+	+	+	+	+	+	+	-	+	-	-	-	..
C.4 ..	"	Longus ..	"	+	-	+	+	+	+	±	±	-	+	..	-	+	..
C.5 ..	"	"	Small flocculent	+	-	+	±	±	+	-	-	-	+	..	-	..	..
C.11	"	(Medius, } Brevis, } 9.7.08 } 14.7.08 }	Flocculent balls	+	-	+	+	+	+	+	+	-	+	-	+	-	..
C.8 ..	"	Longus ..	Flocculent ..	Clot	-	+	+	+	±	-	-	-	+	..	-	+	..
G.1 ..	"	"	Heavy flocculi	+	+	+	+	±	±	-	-	-	+	..	..	+	Same colony tested on different dates after isolation.
" ..	20.8.08	"	Flocculent balls	±	-	+	-	-	-	-	-	-	..	..	..	±	
" ..	15.9.08	Medius ..	"	+	-	+	-	-	-	-	-	-	..	..	..	..	
Ge. ..	9.7.08	Longus ..	Flocculent ..	Clot	-	+	+	±	±	-	+	-	+	..	-	+	Same colony tested on different dates after isolation.
" ..	20.8.08	"	"	"	-	+	+	-	-	-	-	-	..	..	..	..	
" ..	15.9.08	Medius to longus	Flocculent ..	-	-	+	-	-	-	-	-	-	..	..	..	..	
G.7 ..	9.7.08	Longus ..	Finely granular	Clot	+	+	+	-	±	±	-	-	+	..	-	+	Same colony tested on different dates after isolation.
" ..	20.8.08	"	"	"	+	+	+	-	-	-	-	-	..	..	..	..	
" ..	15.9.08	"	"	"	-	+	-	-	-	-	-	-	+	..	..	..	
G.8 ..	9.7.08	Medius to brevis on 24.7.08	Flocculent, dif-fuse on 24.7.08	+	-	+	+	-	±	±	-	-	+	..	+	+	..
C.16..	"	Brevis ..	Diffuse ..	Clot	-	+	±	-	-	+	+	-	+	..	..	-	..
Me. ..	21.7.08	"	"	-	-	+	+	+	+	+	-	-	+	..	..	..	..
M.11	"	Brevis to medius	"	-	-	?	+	+	+	+	-	-	+	..	..	..	..
M.13	"	Brevis ..	"	Clot	-	+	+	-	±	+	-	-	+	..	-	..	..
M.14	"	"	"	+	-	+	+	+	+	+	+	-	+	..	-	..	..
M.10	21.7.08	Brevis to medius	Diffuse ..	+	-	+	+	-	+	+	+	-	+	..	..	+	..
" ..	20.8.08	"	"	+	-	+	+	-	+	-	-	-	..	..	..	+	Same colony tested at different dates after isolation.
" ..	15.9.08	"	"	-	-	+	-	+	+	±	-	-	..	..	..	Green tint	
" ..	"	"	"	-	-	+	+	+	+	±	-	-	..	..	..	Light green tint	



REACTIONS GIVEN BY STREPTOCOCCI ISOLATED FROM NINE NORMAL THROATS.—Continued.

Number	Date	Morphology	Appearance of broth	Milk	Neutral red	Saccharose	Lactose	Raffinose	Inulin	Saline	Conifertin	Man-nite	Nitrate broth reduced to NO <sub>2</sub>	Gelatin time	Hemolysis	Remarks
Cal.8	12.8.08	Brevis	Diffuse	Clot	+	+	+	+	-	-	-	-	..	+	..	..
Cal.9	"	Longus	Flocculent balls	"	-	-	+	+	-	-	-	-	..	Very slight	..	Same colony.
"	15.9.08	Brevis to medius	..	+	-	+	+	+	-	±	-	-	..	..	..	Same colony.
"	24.10.08	..	..	Clot	-	+	+	+	-	+	-	-	..	..	..	Same colony.
Col.10	12.8.08	Brevis	Diffuse	+	-	+	+	-	-	+	-	-	..	..	..	Same colony.
"	15.9.08	"	"	+	-	+	+	-	-	+	-	-	..	..	..	Same colony.
"	23.10.08	"	"	-	-	+	+	-	-	+	-	-	..	..	..	Same colony.
S.1	12.9.08	Longus	Flocculent balls	Clot	+	+	+	-	-	+	-	-	1	+	Light olive green halo	Same colony.
"	14.10.08	"	"	"	-	+	+	+	-	-	-	-	..	+	Olive green halo	Same colony.
S.2	12.9.08	"	"	"	+	+	+	-	±	-	-	-	..	+	Olive green halo	Same colony.
"	14.10.08	"	"	"	..	+	+	-	-	+	-	-	..	..	+	Same colony.
S.4	12.9.08	Medius	Granular	-	..	+	+	-	-	+	-	-	..	..	Olive green	Same colony.
"	14.10.08	Longus	Lightly flocculent	Clot	-	+	+	-	-	-	-	-	..	..	+	Same colony.
"	14.10.08	"	"	"	+	+	+	-	+	-	-	-	..	..	Olive green	Same colony.
S.6	12.9.08	Medius	Granular	"	+	+	+	-	+	-	-	-	..	..	..	Same colony. Last two from different sub-cultures.
"	14.10.08	"	"	"	-	+	+	-	-	-	-	-	..	..	..	Same colony.
"	12.9.08	Medius	"	Clot	..	+	+	+	+	+	-	-	..	..	..	Same colony.
S.8	14.10.08	"	Granular	"	-	+	+	+	+	+	-	-	..	..	..	Same colony.
"	12.9.08	"	"	"	+	+	+	+	+	+	-	-	..	..	..	Same colony.
S.12	12.9.08	"	Flocculent balls	"	-	+	+	+	+	+	-	-	..	..	+	Same colony.
"	14.10.08	"	"	"	-	+	+	+	+	+	-	-	..	..	Olive green	Same colony.
"	21.10.08	Medius	"	+	-	+	+	+	+	+	-	-	..	..	..	*Grew very long in lactose.

S.13..	12.9.08	Medius	..	Lightly floccu- lent	Clot	-	+	+	-	-	-	..	+	Olive green	Same colony.
" "	21.10.08	" "	..	" "	" "	-	+	+	-	-	-	..	+	..	Same colony.
S.14..	12.9.08	Medius	..	Flocculent balls	" "	-	+	+	-	-	-	..	+	Olive green	Same colony.
" "	21.10.08	" "	..	" "	+	-	+	+	-	-	-	..	+	Light Olive green tint	Same colony.
S.16..	12.9.08	Medius	..	Diffuse with light flocculi	Clot	-	+	+	-	-	-	..	+	..	Same colony.
" "	21.10.08	" "	..	Lightly floccu- lent	" "	-	+	+	-	-	-	..	+	No growth	Same colony.
S.19..	12.9.08	" "	..	Lightly granu- lar	+	-	+	+	-	-	-	..	+	+	Same colony.
" "	21.10.08	" "	..	" "	±	-	+	+	-	-	-	..	+	Olive green	Same colony.
S.26..	12.9.08	Brevis	..	Diffuse	..	-	+	+	-	-	-	..	+	..	Same colony.
" "	21.10.08	" "	..	" "	..	-	+	+	-	-	-	..	+	..	Same colony.
Br.5..	7.10.08	Brevis	..	Diffuse	Clot	-	+	+	-	-	-	..	+	..	Same colony.
" "	23.10.08	" "	..	" "	" "	-	+	+	-	-	-	..	+	..	Same colony.
Br.6..	7.10.08	" "	..	" "	Clot	-	+	+	-	-	-	..	+	..	Same colony.
Br.7..	" "	" "	..	" "	" "	-	+	+	-	-	-	..	+	..	Same colony.
Br.8..	" "	Lanceolate diplococci	..	" "	" "	-	+	+	-	-	-	..	+	..	Same colony.
Br.9..	" "	Brevis to medius	..	" "	+	-	+	+	-	-	-	..	+	..	Same colony.
S.27..	12.9.08	Diplococci	..	" "	Clot	-	+	+	-	-	-	..	+	Olive green	Same colony.
" "	21.10.08	" "	..	" "	" "	-	+	+	-	-	-	..	+	..	Same colony.
S.29..	12.9.08	Brevis	..	Diffuse	..	-	+	+	-	-	-	..	+	..	Same colony.
" "	21.10.08	" "	..	" "	Clot	-	+	+	-	-	-	..	+	..	Same colony.

The letters under number indicate the particular throats from which the colonies were isolated.  
The number following the letters in the same column indicates the colony from the throat.  
+ ..... acid ..... in case of the sugar.  
± ..... slightly acid .....  
- ..... no production of acid .....  
+ ..... under haemolysis indicates production of a clear halo round the colony.  
+ ..... under milk indicates acid without clot.

REACTIONS GIVEN BY STREPTOCOCCI ISOLATED FROM NINE NORMAL THROATS.—Continued.

Number	Date	Morphology	Appearance of broth	Milk	New- tral rel	Saccha- rose	Lactose	Raffi- nose	Imm- lin	Sal- cin	Coni- ferin	Man- nite	Mal- tose	Nitrate broth reduced to NO <sub>2</sub>	Gela- tine	Hæmo- lysis	Remarks
Br.1.	7.10.08	Brevis	Diffuse	Clot	-	+	+	+	-	-	-	-	+	-	..	..	Same colony.
" "	23.10.08	" "	" "	" "	..	+	+	+	+	-	-	-	..	-	..	..	Same colony.
Br.4	7.10.08	Brevis	Diffuse	" "	-	+	+	+	+	+	-	-	..	-	..	..	Grew very long in
" "	23.10.08	" "	" "	Clot	-	+	+	+	+	-	-	-	..	-	..	..	raffinose.
Br.10	7.10.08	Brevis to medius	Flocculent	" "	-	+	+	+	-	+	+	-	+	-	..	..	Grew long in sac- charose.
Br.11	"	Brevis	"	+	-	+	±	-	-	+	+	-	+	-	..	..	
Br.12	"	Medius to longus	Diffuse	Clot	+	+	+	+	+	+	+	-	+	-	..	..	Grew long in raffi- nose.
Br.13	"	Brevis	" "	" "	-	+	+	-	-	+	-	-	+	-	..	..	Same colony.
Br.16	"	" "	" "	-	-	+	+	+	-	+	+	-	+	-	..	..	
Br.17	24.10.08	" "	" "	Clot	-	+	+	+	-	+	+	-	+	-	..	..	
Br.18	7.10.08	Brevis	Diffuse	" "	-	+	+	+	-	-	-	-	..	-	..	+	
Br.20	"	" "	" "	Clot	-	+	+	+	+	-	-	-	..	-	..	..	Grew very long in saccharose.
Br.21	"	" "	" "	+	-	+	+	-	-	-	-	-	..	-	..	+	Grew long in sali- ciu.
Br.22	"	" "	" "	-	-	+	-	-	-	-	-	-	..	-	..	+	
St.2.	21.10.08	Lanceolate diplococci	" "	-	-	+	-	+	+	+	+	-	..	-	..	..	
St.13	"	Brevis	" "	-	-	+	-	+	+	+	+	-	..	-	..	..	
St.14	"	" "	" "	-	-	+	-	+	+	+	+	-	..	-	..	..	
J.1	31.10.08	Brevis to longus	" "	Clot	+	±	+	+	-	+	+	-	..	-	..	+	
J.2	14.11.08	Longus	" "	-	..	±	+	-	-	+	+	-	..	-	..	..	
J.3	31.10.08	Brevis	" "	+	..	-	+	-	-	+	+	-	..	-	..	+	
J.4	"	Brevis to longus	Diffuse	+	-	-	-	-	-	+	+	-	..	-	..	+	Same colony.
" "	14.11.08	" "	" "	Clot	-	+	+	+	+	+	+	-	..	-	..	..	
J.5	31.10.08	Brevis to longus	Diffuse	-	-	-	-	+	+	+	+	-	..	-	..	..	
J.6	"	" "	" "	-	-	+	-	+	+	+	+	-	..	-	..	..	
" "	14.11.08	Brevis	" "	Clot	-	+	+	+	+	+	+	-	..	-	..	..	Same colony.
J.7	31.10.08	" "	Diffuse	-	-	-	-	+	+	+	+	-	..	-	..	..	



REACTIONS GIVEN BY STREPTOCOCCI ISOLATED FROM EIGHT SORE THROATS.—Continued.

Number	Date	Morphology	Appearance of broth	Milk	Neu- tral red	Saccha- rose	Lactose	Raffi- nose	Inu- lin	Sal- cin	Coni- ferin	Man- nitolose	Nitrate broth reduced to NO <sub>2</sub>	Gela- tine	Hemo- lysis	Remarks
E.5 ..	3.12.08	Brevis	Diffuse	Clot	-	+	+	-	-	+	-	-	-	+	..	Same colony.
" ..	16.1.09	"	"	"	-	+	+	-	-	+	-	-	-	..	..	Grew long in salicin.
E.6 ..	3.12.08	Brevis	Diffuse	"	-	+	+	-	-	+	-	-	-	+	..	Same colony.
" ..	16.1.09	"	"	"	-	+	+	-	-	+	-	-	-	..	..	Same colony.
E.7 ..	3.12.08	Brevis medius	Diffuse	"	-	+	+	-	-	+	-	-	-	..	..	Same colony.
" ..	16.1.09	"	"	"	-	+	+	-	-	+	-	-	-	..	..	Grew long in coniferin.
E.8 ..	11.1.09	Brevis medius	Diffuse	"	-	+	+	-	-	+	-	-	-	..	..	Same colony.
F.2 ..	13.12.08	"	Diffuse	"	-	+	+	-	-	+	-	-	-	+	..	Same colony.
" ..	8.1.09	"	"	"	-	+	+	-	-	+	-	-	-	..	..	..
K.6 ..	23.12.08	Medius	Granular	-	-	+	+	-	-	-	-	-	-	..	..	..
K.9 ..	"	"	"	Clot	-	+	+	+	-	-	-	-	-	..	..	..
L.1 ..	28.12.08	Brevis	Diffuse	"	Con- tn.	+	+	+	-	+	-	-	-	..	..	Same colony.
" ..	16.1.09	"	"	"	+	+	+	+	-	-	-	-	-	..	..	Same colony.
L.2 ..	28.12.08	Brevis	Diffuse	"	+	+	+	-	-	+	-	-	-	+	..	Same colony.
L.3 ..	16.1.09	"	"	"	-	+	+	+	-	+	-	-	-	..	..	..
L.4 ..	28.12.08	Brevis	Diffuse	"	-	+	+	+	-	+	-	-	-	..	..	..
L.5 ..	"	"	"	"	-	+	+	+	-	+	-	-	-	..	..	..
" ..	"	Brevis longus	"	"	-	+	+	+	-	+	-	-	-	..	..	..







given by the streptococci from the pathological as distinguished from those isolated from normal throats. In fact, out of 50 groups of reactions in the pathological series, all but 7 corresponded with one or other group in the normal series. Of these 7, 4 corresponded with Andrewes' and Horder's variety 2e (*S. salivarius*), and 3, isolated from the same throat, and which gave identical reactions, might possibly on account of their length of chain be classed as a variety of *S. anginosus*. Out of 127 times they were tested, the normal series gave 52 different groups of reactions, while the pathological series, out of 51 times they were tested, gave 11 different groups of reactions.

*Constancy of the Reactions.* — Thirteen colonies were tested three times at intervals varying from one to three months after first isolation, and of these only two retained their original characteristics. Forty colonies were similarly tested twice, and of these six remained constant to their original characteristics.

An analysis of the various groups of reactions given on the different occasions showed the following results :—

Out of 45 colonies which originally fermented saccharose, 3 failed to do so on re-testing after subculture; and of 6 which originally failed to ferment this sugar, 3 did so on retesting. Similarly out of 41 which originally fermented lactose, 10 failed to do so later, and of 10 which originally failed, 7 gave the reaction later. Out of 21 which originally fermented raffinose, 12 subsequently failed, and of 30 which originally failed, 7 subsequently gave the reaction. Out of 17 which originally gave the reaction to inulin, 14 subsequently failed to do so, and of 34 which originally failed, 1 subsequently fermented this carbohydrate. Out of 27 which originally fermented salicin, 9 subsequently failed, and of 24 which originally failed, 8 subsequently gave this reaction. Out of 14 which originally fermented coniferin, 7 subsequently failed, and of 37 which originally failed, 3 subsequently gave the reaction. Out of 51 which originally failed to ferment mannite, none did so later.

Length of chain is a characteristic on which Andrewes and Horder appeared to have laid a certain amount of stress in classifying their streptococci. Possibly, taken from the growth in plain broth it may be of some value, but it was frequently found that streptococci which originally grew short in plain broth grew long or very long in some of the different media, and in going through a series of tubes of cultures of the same colony in the various media it was frequently noted that in one the chains were short, in another long, and in still another of medium length.

*Conclusions.*—(1) Judging by the results of these tests, no preponderating characteristics were found to pertain to the streptococci isolated from sore throats which would distinguish them from those isolated from normal throats; (2) the inconstancy of their reactions after subculture for varying periods would indicate that any classification based on these tests is unreliable.

AN INVESTIGATION INTO THE MICRO-ORGANISMS PRESENT  
IN NORMAL AND PATHOLOGICAL THROATS, WITH  
SPECIAL REFERENCE TO THEIR REACTIONS TO  
GORDON'S TESTS FOR STREPTOCOCCI.

BY CAPTAIN J. C. KENNEDY.

*Royal Army Medical Corps.*

(I.) *Normal Throats.*—Thirty-three organisms were isolated from three normal throats by means of aerobic cultures on agar and kept alive by repeated subculture on Löffler's serum. The following table gives the morphology of these and their reactions to Gordon's tests. It will be noted that the majority appear to be diplococci, though they grow into long chains in the sugar media.

An examination of the table will show how inconstant the sugar reactions are; the one exception being maltose, which is positive and remains constant in every case. Each colony was put through the tests twice, but in every instance there was either the addition, or, more commonly, the loss of a reaction. For instance, two subcultures (II. P' and II. P'') were made from No. 8 colony, and were both put through the tests. On the first occasion they gave identical reaction, on the second P' failed to ferment saccharose, while P'' failed to ferment both saccharose and raffinose. After maltose the milk reaction is the most constant, then lactose and saccharose.

(II.) *Pathological Throats.*—A series of five sore throats was examined in the same way.

(1) Follicular tonsillitis, showing deep injection of the uvula and anterior fauces and followed later by formation of abscesses in both tonsils. Swabs from the throat gave colonies 1 to 5; cultures from the pus gave colonies 6 to 8.

(2) Follicular tonsillitis with formation of greyish-white patches on the surface of the tonsils.

(3) Similar to (2) and occupying bed next to (2) in Wellington Barracks.

TABLE I.

DESIGNATION										MORPHOLOGY					
Serial No.	Throat	Colony	Milk clot	Neutral red	Mal-rose	Saccha-rose	Lac-rose	Raffi-nose	Inulin	Salicin	Confi-ferin	Man-nite	Gram's stain	On Löffler's serum	In sugars
1	I.	N.	-	-	+	+	-	-	-	-	-	+	-	Diplococcus (staphylococcus)	No change.
2	II.	M.	-	±	+	+	+	-	-	-	-	-	+	"	"
3	II.	A.	-	±	+	+	+	+	+	+	-	-	+	"	" (large)
4	III.	A.	-	-	+	+	-	-	-	+	-	-	+	"	" (large)
5	III.	O.	+	-	+	±	+	-	-	±	-	-	-	"	Chains 2-6.
6	III.	P.	+	-	+	+	+	-	-	-	-	-	±	"	"
7	III.	Q.	+	-	+	+	+	+	+	+	-	-	±	"	"
8	II.	P.	+	+	+	+	+	+	±	-	-	-	+	Diplococcus (lanceolate)	Chains.
	II.	P."	+	-	+	+	+	+	-	-	-	-	+	"	"
9	III.	F.	+	-	+	-	+	+	-	+	-	-	+	"	"
10	II.	G.	±	-	+	+	- (?)	-	+	-	-	-	-	Diplococcus or streptococcus	Brevissimus.
11	I.	C.	-	-	+	+	±	+	-	+	-	-	+	" (Lanceolate to oval)	"
12	I.	D.	-	-	+	+	-	+	-	+	-	-	+	Diplococcus or streptococcus	"
13	I.	F.	+	-	+	+	-	-	-	-	-	+	+	"	"

[illegible]

TABLE II.

Serial No.	Patho-logical throat	Colony	Litmus milk clot	Neutral red	Mal- tose	Saccha- rose	Lactose	Raffi- nose	Inulin	Salicin	Coni- ferin	Man- nite	Gelatin 20° C.	Morphology on Löffler's serum	Gram's stain	Broth culture
1	I.	1	+	-	+	+	+	-	-	+	-	-	Growth	Brevis	±	General haze.
2	I.	5	+	..	+	+	+	-	-	+	-	-	"	"	+	"
3	I.	6	+	..	+	+	+	-	-	+	-	-	"	"	+	"
4	II.	1	+	..	+	+	+	-	-	+	-	-	"	"	+	"
5	V.	5	+	-	+	+	+	-	-	+	-	-	"	"	+	"
6	I.	8	+	-	+	+	+	-	-	+	-	-	"	Medius	+	Woolly deposits.
7	I.	7	+	±	+	+	+	-	-	+	-	-	"	"	+	"
8	I.	4	+	+	+	-	+	-	-	-	-	-	Growth (liq. ?)	Longus	+	"
9	II.	2	+	-	+	-	-	-	-	-	-	-	"	"	+	"
10	III.	2	+	?	+	-	-	-	-	-	-	-	"	"	+	"
11	V.	7	? Acid clot	-	-	-	-	-	-	-	-	-	Nil	Conglomerate	+	Gelatinous deposits.
12	V.	6	+	+	+	+	+	+	+	+	+	-	Feeble	Diplococcus	-	Diffuse.
13	V.	4	+	-	+	+	-	-	-	-	-	-	Nil	Diplococcus (brevis)	+	Diffuse; gelatinous de- posits.
14	V.	3	Alk.	?	+	+	-	-	-	-	-	-	Feeble	Diplococcus (lanceolate)	+	Diffuse; gelatinous de- posits.
15	IV.	2	Alk.	..	±	-	-	-	-	-	-	-	..	Diplococcus (kidney)	+	..
16	IV.	1	+	-	+	±	+	-	+	-	-	-	..	Diplococcus (kidney)	..	Clear, with deposit.
17	I.	3	Alk.	-	-	-	-	-	-	-	-	-	Very feeble	Diplococcus (kidney)	±	..
18	I.	2	-	-	-	-	-	-	-	-	-	-	Very feeble	Diplococcus (kidney)	+	..
19	V.	1	-	-	-	-	-	-	-	-	-	-	Good growth	Staphylococcus citreus	..	Haze + deposit.
	'Hayes	2	+	+	+	+	+	-	±	±	-?	-	Good growth	Brevis	..	..

<sup>1</sup> This streptococcus is added to the table by way of comparison, being obtained from a septic wound of the hand. It was found to be non-pathogenic for rabbits.

(4) Follicular tonsillitis. The tonsils were enlarged and there was a greyish deposit in the follicles.

(5) Suppurative tonsillitis. Cultures were made from the pus. The organisms isolated came under the following headings.

STREPTOCOCCI					DIPLOCOCCI		STAPHYLOCOCCUS
Throat	Brevis	Medius	Longus	Con-glomeratus	Lanceolate	Kidney Shape	Citrens
I.	3	2	1	..	..	2	..
II.	1	..	1	..	..	..	..
III.	..	..	1	..	..	..	..
IV.	..	..	..	..	1	1	..
V.	2	..	..	1	2	..	1
	6	2	3	1	3	3	1 = 19

These organisms had been put through Gordon's tests once only, when the work had to be discontinued (*vide* Table II.). The *S. longus* culture obtained from the similar throats (II. and III.) were similar morphologically, but III. reacted to saccharose and lactose, while II. did not. Most of the varieties isolated corresponded more or less to Andrewes' and Horder's types of *S. salivarius*, *S. anginosus* and *diplococci*.

## WAR TRAINING.

BY COLONEL T. M. CORKER.

AT our last annual dinner the Director-General, in a speech reported in the July number of the JOURNAL OF THE ROYAL ARMY MEDICAL CORPS, drew particular attention to the necessity of studying not only our own organisation in war, but also problems in military strategy and tactics generally. He touched a chord that fully responded. The suggestion that knowledge of military strategy on our part is uncalled for and unnecessary has been most unacceptable to our officers in the past. There is no phase of our work more important than that which yields positive proof of the great part the Corps plays in the success of military operations—by clearing the area of conflict of the wounded that would hamper the movements of the General Officer Commanding-in-Chief, and by dealing with them in such prompt and capable fashion that the dreadful sights of ancient battlefields may no longer horrify the eye and lower the morale of the rest of the troops.

But before we turn to a consideration of practical methods of training in the art of war, it will be useful to review briefly our position in peace. There is a consensus of opinion in the Corps, in our profession, in the Army at large, and in the War Office, that we fulfil our duties with increasing efficiency with each successive year. This, too, the Director-General has insisted upon, and statistics in proof were given in Parliament in the discussion on the Estimates. They will be found reported in the leading papers, and should be kept continually in mind. Lord Kitchener, in his farewell speech in India, quoted in the *Naval and Military Gazette* of September 4th, has again referred to the enormous diminution in sick-rate, death-rate, and invaliding. Officers should have these figures at their finger-ends. They will at least remember without great mental strain that our Corps is able to provide the British Army of to-day with two full regiments that lay ill in hospital in the past. Other data will be found in an address by Sir Alfred Keogh, reported in the April number of our Journal. I may add a personal note: One of our leading civilian surgeons said to me the other day that there were fewer men invalided with surgical affections to be found in the civil hospitals than formerly. It was with considerable satisfaction I explained to him that the Corps now did its own surgery, and he offered his congratulations.

It is well to keep these points in mind in order to maintain a very necessary *esprit de corps* and self-respect, and it is particularly desirable that the clever young officers we welcome every year should know exactly where they stand. It is not they who shed lustre on the Corps: their day is yet to come. But it is their function to keep brightly burning the light that they find already lit, and to leave nothing undone, in big or little matters, that will maintain or enhance its brilliancy. Those I have met seem most loyally anxious to do this. No one in fact can rest on his oars. The Royal Army Medical Corps is born to be *fidelis in arduis* as the sparks fly upwards. And even in the retired ranks, among those entitled to enjoy *otium cum dignitate*, we discern, in the spirit that brings them to our dinner and stimulates them to serve on committees, a loyal interest that cannot fail to impress and encourage those in harness.

Turning from what may be termed the peaceful side of our labours, we enter a somewhat different arena when we consider our work in war. In the control of decimating diseases and in sanitary work we may hope in the near future to be greatly assisted by the increasing knowledge of other branches of the Service, and by the fact that no commander in the field in the future is likely to look with approval on any Commanding Officer who loses many men from zymotic disease under conditions that may be traced to ignorance or inattention to detail. But we have another great function, and almost a purely military one—the subject of this paper—the duty of clearing away the wounded so that the General-in-Chief may continue his responsible strategical work untrammelled by men who, without us to remove them, might ruin his best-laid schemes. We in the Corps have not yet arrived at finality in our dispositions, and it is possible we shall never do so. In every sphere in this universe it has been said that change is the only factor that is itself changeless, and evolution the only absolute mathematical constant. Wireless and aeronautic developments, the increasing range and destructiveness of guns, all affect strategy and tactics, and modify our own work in turn. But we cannot ourselves be prepared to follow these changes with practical sense and efficient action unless we follow closely the advancing wave. As in medicine, surgery, and sanitation, so it is in war work: our officers must thoroughly understand operation orders, and this understanding must become practised and intuitive, and not formal, stereotyped, and old-fashioned. So only can we perform our national duty in war and at the same time increase the reputation which it is recognised



the Corps possesses. It is, moreover, incumbent on N.C.O.'s and men in varying degrees to follow intelligently the tactical situation, and (to anticipate what will be repeated later) no feature in our recent training was more satisfactory than the enthusiastic response of our N.C.O.'s and men to ideas of our modern war training as compared with the unthinking mechanical work of the past. The officers in charge of the training were greatly pleased with the response of the rank and file.

With these general observations on the aim and work of the Corps, we come to consider in detail the training that will enable us to carry out the functions we conceive to be demanded from us: that is, first, the training of officers in administrative and executive duties; secondly, the training of a company in work on the field of battle.

Now, it is not altogether easy for officers of the Royal Army Medical Corps to be detached for manœuvres and staff rides. We are a hard-worked crew and there are many demands upon us. Moreover, a certain amount of preliminary study and knowledge is needed before anything like a tactical tour can be appreciated or intuitive precision attained in such points as the disposal of field ambulances on congested routes, the issue of orders during an action, and the removal of wounded under the varying conditions of advance and retreat. It is necessary, too, that each officer should have an exact knowledge of principles and regulations, of the figures and data contained in the latest editions of military handbooks issued by the War Office, and in articles and pamphlets on Corps work. Without this knowledge he thinks loosely and inaccurately on military points, even those relating to his own Corps, very much as so many of our combatant brethren do with regard to sanitation. We expect them, in the twentieth century, to learn a good deal of our particular work, and equally we must learn a good deal of theirs. Thus the usual composition of an advanced guard and its recognized function, with its necessarily limited proportion of medical assistance, should be within the ordinary knowledge of a field officer of the Royal Army Medical Corps, just as it is incumbent upon the officer commanding a regiment to understand and fall in with recommendations as to the necessity of boiling water for drinking or of antityphoid inoculation. This need of knowledge in common, of mutual interchange of ideas, is quite recognised by thinking men.

The books and pamphlets it is necessary to be familiar with and to mark with the red pencil of wisdom are these:—

(1) "Field Service Regulations," Part I., Operations, 1909; (2) "Field Service Regulations," Part II., Organisation and Administration, 1909; (3) "Training and Manœuvre Regulations," 1909; (4) "Field Service Pocket Book," 1903; (5) "War Establishments," 1908-09; (6) "Field Service Manual," 1908, Army Medical Service (Appendix 35 is a most valuable diagram); (7) the admirable papers by Lieutenant-Colonel Macpherson, a very useful article on second line transport by Major Birrell, in the number for June, 1909, and numerous other excellent contributions in our Journal. To these we may usefully add (8) Lieutenant-Colonel Macpherson's "Russo-Japanese War"; (9) books such as the "Science of War," by the late Colonel Henderson, and works on Staff Rides (obtainable from Regimental Officers); (10) copies of Medical Staff Rides (obtainable from brother officers).

This list is less formidable than it looks and the work to be done less than might be expected, and yet it is very necessary, and also very interesting, as every officer readily admits when he has once mastered the groundwork.

Having assimilated the orders and principles in these books and articles, and also having grasped some idea of the problems we have not yet completely solved, such as the transfer of wounded from field ambulances to the rear, *the careful study of a tactical tour* should next be undertaken. I have to thank Surgeon-General Bourke for several copies of his "Carlow Staff Ride of 1908," and Surgeon-General Sir Thomas Gallwey for his Ride based on the Aldershot Manœuvres of 1908. Full use has been made of both. During Christmas, 1908, I collected the officers on duty in Edinburgh, and on six afternoons we worked at the Carlow Ride, which was subsequently lent to several officers, both Regular and Territorial. A good plan is to place the map before a class, and, when they have studied it for a time and heard the general scheme, to ask them to note roughly on paper what they would do here and there on successive days as the fight proceeded, and then to read out the dispositions regarded as the best. Differences of opinion are healthy rather than otherwise. To answer with any readiness is impossible at first, but each officer feels a glow of satisfaction when later on he begins to see approximately what he should do and what orders he should give. On several evenings during the training of the 13th Company, Royal Army Medical Corps, at Barry, Captain McLennan, who was at first in command, worked out a special local scheme which the General Staff drew up for us, and the next night I visited the camp and went over the work.

The problems included a visit to a neighbouring town to pick out buildings for stationary hospitals, shops with medical material, and horses in livery stables for the transport of clearing hospitals; also a visit to a battle area five miles off to correct ideas as to dressing-stations, problems as to advanced guards, re-embarkation, &c. All these visits were not made owing to the weather and want of time, but the points were nevertheless studied and appreciated. A week later I took down the Aldershot scheme, and we spent two evenings in discussing its features, Major Scott carrying on the work subsequently, and, as the N.C.O.'s and men themselves seemed very keen, a lecture on this same tour was also given to them by Captain McLennan. It was thought the audience might be bored, but nothing of the kind happened, and the men followed the probable work of their units with much interest and appreciation. Further, as Colonel Hunter-Weston could not come to lecture as we had hoped, Colonel Forde, commanding the 40th Brigade Royal Field Artillery, then in camp, very kindly gave two lectures on operation orders and map reading.

In addition to study of staff rides, each officer had been directed during the past winter to submit a thesis on the work of the Royal Army Medical Corps in war. Some very poor theses were submitted, but others were most instructive and interesting. Captain Rutherford sent in a most comprehensive paper, and so did Captain McLennan. Captain Harding dealt chiefly with data derived from past wars which a Director of Medical Services should know. Major Scott made useful and suggestive recommendations as to future wars. But the point I desire to emphasize particularly is the progress generally attained, so that every officer in the command has now either a very good idea of what is required from him in war, or at least a fair notion of what he ought to know and how to rapidly acquire that knowledge. I would suggest, if it has not already been done, that a short course of the kind might form part of the studies of our young officers when they first join our College. It would make them feel from the outset what an integral factor the Corps forms in war, and it would bring them into immediate touch with the purely military side of their life, with obvious advantage in several directions.

The unit in training was a section of a field ambulance containing normally four officers. The General Officer Commanding in Scotland, however, gave permission to take as many officers to camp as I wished, and no fewer than eleven officers attended, some for the whole fortnight, others for shorter periods. One of the features

not previously introduced was instruction by the Quartermaster in methods of drawing and returning stores and completing documents. Captain Brook's lectures dealt with discrepancy vouchers, expense vouchers, rations, fuel and light, and medical and surgical equipment, opening, closing and rendering accounts, and with such forms as G 968, G 973, G 980, G 1,033, P 1,925, F 776, B 56, F 727, and F 1,209. Every officer who desires to understand the machinery and internal economy of a field ambulance should keep a set of these forms incorrectly made out in some details in black ink and corrected in red. I think a separate article from Captain Brook would prove decidedly useful.

We come now to the more particular training of the N.C.O.'s and men. A retrospect of past trainings is instructive, as it shows how the study of any problem develops by degrees in interest and effectiveness. In 1906 we could not see our way to a training at all; it was novel and there were evident difficulties. So we had none. In 1907 it was felt an effort should be made, and that perhaps equipment, wagons, horses, &c., could somehow be obtained. Lieutenant-Colonel W. G. Birrell took charge, and the training was carried out at Stobs. We then realised our difficulties and how to meet them. Next year, at Barry, Lieutenant-Colonel Austin commanded, and further progress resulted. But we still had to draw twenty men from Aldershot, and the equipment left much to be desired. This year the Assistant Director of Ordnance Services, Colonel Anley, took a great deal of trouble about equipment, and the section was practically complete. At the last moment an operation tent was obtained from the Aberdeen Territorial Field Ambulances. The Army Service Corps gave us all we needed in horses and wagons, and the King's Own Scottish Borderers kept us liberally supplied with wounded. As to the contingent from Aldershot, we practically did without it. Eight men of the Royal Army Medical Corps were sent up in advance to cover future casualties, and two Special Reservists were also put in to make up the sixty-one. In the meanwhile the hospitals in the command were manned by special reservists to a great extent, and this was another new feature, and a very important one. I should like to go a little further in future, and to bring to training almost every N.C.O. in the company, supplying their places at out-stations by regimental N.C.O.'s for disciplinary purposes. This would mean 6d. a day for each N.C.O. during that period, and requires a little thought and some preliminary negotiations with the Chief Accountant. Some of our N.C.O.'s get too much into

a grove and sadly need a fortnight's brushing up in war work; others are extremely keen and enjoy such a training immensely. Whether keen or not, the effect on all ranks, as was evident to me and as finally reported by Major Scott, was most marked, and the company left camp a very different unit. All were manifestly pleased with the improvement they had made.

And now we may deal with the bedrock work of the men. I have always felt that dancing quadrilles round a stretcher, however useful as a preliminary drill, utterly failed to develop the higher work of which our men are capable. Some of us had had the advantage of seeing Lieutenant-Colonel James training the Officers Training Corps in advancing by rushes to collect wounded, taking cover under fire like well-trained infantry, instead of presenting themselves in a solid block, a sextuple phalanx for all and sundry to practise musketry upon. Officers commanding detachments of the Royal Army Medical Corps had been asked to bring their N.C.O.'s and men to such a standard of drill that no time need be lost in brushing up what every recruit knows, in order that this new advance and other forms of actual war work might be studied from the outset. I may add that one or two officers at out-stations seemed to think no drill could be carried out without six men, as if in war we had not constantly to work with even as few as two bearers to a stretcher. Then, again, it has seemed to me that however interesting physiological knowledge as to the interchange of gases in the blood may be, it is somewhat more valuable to know how to prevent a man from bleeding to death. Some orderlies will talk with parrot-like facility of "controlling the subclavian," but if asked to put the tip of a finger on even the radial or the ulnar, they show a most marked ignorance. During this training each squad was taught that the first duty was to stop the bleeding, and it was satisfactory in the end to see a man pounce at once upon the nearest main vessel and hold it while the others formed improvised splints, &c.

The actual method of dealing with the wounded man without moving him required study, and here I must add some personal experiences. In the Indian Frontier campaign in 1897 we found that the good old Indian doolie was a common mark for the enemy, and, in addition, could not be carried on precipitous ground. By degrees then we all adopted the blanket stretcher—that is, an ordinary blanket doubled, to form a bag open at both ends, with the poles stitched into the edges of the bag, or simply run along inside. My own practice when out with a brigade was to put two

Kahars and either an assistant surgeon or a trained regimental orderly with each blanket stretcher. I generally started with eight or ten such parties, and gradually sent them off here and there as companies or regiments took up their positions. Usually this party of three carried another blanket, a few drugs, splints and bandages, some sticks and matches, water, a tin of beef-tea, and possibly a syringe and morphia. Thus each small party became the ultimate unit, the nucleolus, of a hospital. A special net through which rifles might be passed was sometimes added, and I may mention this again. The object aimed at was not only the avoidance of a mark to fire at, but the use of a light conveyance, and the supply of certain comforts for the wounded who might have to remain with the company for many hours, as they could not safely travel back alone.

Now in modern war with civilised troops we again approach a similar position. Lieutenant-Colonel Macpherson has dealt with this phase of our work very fully in pamphlets that form the basis of all our succeeding work, and has insisted that it may be impossible to remove wounded at all until long periods have elapsed. Each stretcher party should therefore regard itself, and be to some extent equipped, as a dressing-station, and should carry an extra blanket and waterproof sheet, a pick or spade, some strong cord, the articles mentioned above, &c.

At the final inspection great proficiency was attained in all the items of this higher training. Lieutenants Pottinger and Taylor controlled the advances with whistles, officers and men lying down and taking cover, then advancing by rushes, and acting similarly when retiring with wounded. All this was carried out among the sandhills of Barry, the scene, by the way, of a very bloody battle in the eleventh century, when Malcolm II. defeated a Danish army. When the tally indicated hæmorrhage the artery was in most cases immediately and correctly controlled, instead of the supposed patient being allowed to bleed to death while No. 4 played happily with a complicated tourniquet. For urgent work the bearers might also carry a yard of indiarubber tubing. Grass, sticks, and rifles were used as improvised splints. One new feature was a coat bound round a strong stick or rifle, and slung on a bearer's back by the rifle slings. The wounded man then sat pick-a-back on this. Much injured men were placed in a shelter dug in the ground, and blanket tents were erected. Several officers of other corps were present, and commented upon the intelligence and cleverness of our men. It was a phase of our work they were unfamiliar with,

and they were evidently impressed by the fact that our men had been trained to do what they thought only a surgeon could manage. Another improvisation has been described as my net. This is a rough net some 2 ft. square with holes at the corners. Rifles are thrust through and a seat is formed. The patient should sit side saddle, leaning back in the arms of the rear bearer. The net can be made to weigh 4 oz., and a small party on an advanced post would find the method easy and useful on narrow hill paths. This simple stretcher can easily be made from other material as well.

Since some of the bearers will certainly be wounded it may be necessary to put four men to a stretcher. Under such circumstances it is advisable to direct a more frequent use of the blanket stretcher, and thus to have the power of doubling the number of stretcher parties at need. If, after an action, regimental units are called on to assist in clearing a field, the blanket stretcher would certainly be useful. Again, is it not clear that our bearer division as well as our nursing section must be *au fait* with the immediate treatment of arteries, fractures, and wounds generally? But these and many other ideas will suggest themselves the more we study the subject.

Another very important feature that requires much attention is the linking up of the regimental bearers with those of the Royal Army Medical Corps. An attempt was made to carry this out practically, but no trained regimental bearers were available. A medical officer and two men per company should, whenever possible, turn out for field days with the Royal Army Medical Corps Company, and study exactly the same procedure as described for the bearer divisions. The linking up of regimental and field ambulance bearers with the collecting and dressing stations, by semaphore and other signals, should also be demonstrated. This was done. Our men are taking much interest in this new development. I have referred to the appreciation expressed on seeing our men's work. Efforts should be made to show this work more generally and to insist that the regimental bearer be really thoroughly trained in stopping hæmorrhage, digging shelter pits, erecting tents d'abri, &c. Theoretically, these bearers should keep moving with the battalion, and hence quick and effective work is expected at their hands before they move on, and when a halt comes in the advance, then all that our field-ambulance officers and men do should also be done by the regimental medical officer and his men. I go further and hold most strongly that every officer and man in the Army should know something of first aid,

and, above all things, of the control of hæmorrhage, and that in this instruction of the soldier in immediate and efficient first aid, each man for himself and his neighbour, we should take a new line such as we have in teaching sanitation. We shall see this new knowledge imparted in the future as soon as officers outside our Corps get over the shock of learning a little more in addition to the weight of wisdom already expected. Our combatant brethren are practical men, and they would soon take to the idea. Double-company training naturally leads up to this. No medical officers went out with these companies in this command this year; a nursing orderly was detailed; but he may fall ill or be injured, and the only immediate aid then available will be that rendered by the company officer and his "two men per company."

At the other end of our field-ambulance work we link up with clearing hospitals, improvised aid and transport, and with second-line transport. No transport may be available. One of the latest ideas of the General Staff is that before any important action is fought all roads in rear will be kept clear for all possible eventualities, and that the second-line transport will be sent 10 or 12 miles to the rear. Under these conditions the field ambulances, in order to preserve their function with the divisions, must, as soon as they have cleared the field, drop their wounded for the clearing hospital to pick up, leaving an officer and a few men temporarily in charge. The ready adaptation of a farmhouse, therefore, becomes another factor in training. There is some confusion of thought as to first-line and second-line transport. Reference to Field Service Regulations, Part II. (Organisation and Administration, 1909), shows what this difference is, and it is also indicated on page 30 of the Field Service Pocket Book. I have already referred to Major Birrell's article in the June number of the Journal; and there is a useful article by Lieutenant-Colonel Heuston in the May number on "Motor Traction." But supposing that this second-line transport *can* come up, it may still need adaptation. This requires further study, and the demonstration of its practicability to the Army Service Corps also demands study, and with this study will come not only new ideas for our Corps, but familiarity with the system on the part of the Army Service Corps themselves, and further willing assistance such as we have already received. A training, then, which shows regimental work in touch with field ambulance work, and that, again, with second-line transport, will demonstrate the intended sequence in the disposition of the wounded.

Loading is another important detail, and with this comes into



play the necessary knowledge of the N.C.O.'s. If loading is carried out in a disorderly fashion, time is lost, equipment is broken, and the packages, if numerous, may not fit in the wagons and carts. But if the equipment fixed upon by the officer commanding for his dressing-station first be laid out in lines in some recognised order, the wagon or forage-cart may be backed to the end of the line, and, on the direction to load being given, the loading may be effected in orderly sequence and with a military precision that cannot fail to make the men feel they are doing smart and useful work. In this way a general service wagon and a forage-cart were heavily loaded and tarpaulins fixed within five minutes. A less proportional time should not be permitted in handling our delicate equipment. The whole section—both sub-divisions—should stand by and witness all work that takes place, so that casualties may be filled up by instructed men. This interchangeability should, to a certain extent, be one of the features of all units that play the hazardous game of war.

From the N.C.O.'s should be expected an intimate knowledge of the contents of all panniers and of modes of packing, and clear ideas as to what is required for dressing-stations. And in the actual work itself, once the preliminary drills are over, no loud-voiced orders should be heard. A quiet word here and there must be enough. Quick work, combined with silence, is a great test of well-trained men, taught to rely upon and to think for themselves.

Then there is sanitary training to be considered. Practical work was carried out by the company—destructors, urinals, new pattern field latrines, straw filter-tubs, all being dug. One of the latest ideas is to cover over all the connecting channels and absorption branches of waste-water pits. Flies will not enter dark places, and thus they are deprived of a breeding-ground. I believe attention was first directed to this point lately in India, but I cannot give the observer's name. Special lectures on sanitation were given by Lieutenant Hingston. Lectures on the Japanese War, comparing the features of British and Japanese field medical arrangements, given in Lieutenant-Colonel Macpherson's book, were delivered by Major Scott and found very entertaining.

The dressing-station work was extremely good and may be described in detail. The company, having been formally inspected and heavy equipment taken off, proceeded to load up and move off, and about a mile away formed its dressing-station. When we returned from the sand-hills and all the wounded had been brought

in and the orderlies questioned on various professional points, the dressing-station was minutely inspected. Kitchens and all sanitary appliances had been prepared and fires lit. Tents d'abri had been erected. Bell tents had been properly pitched (poles and pegs) and provided with bedding, crockery, &c. Every article was laid out for immediate use, as if in action. Within the operation tent a patient lay on a table as if prepared for operation, and the operating surgeon and his assistants all wore gowns or towels; water and lotions, chloroform, strychnine, dressings, &c., were all ready. So realistic was the work that a spectator concluded an actual operation was about to begin and hurriedly left in some dismay. Other nursing orderlies were called in and questioned as to various instruments, and made to use the tube tourniquet and to construct aluminium splints from the coils in the boxes. Some hot bovril was produced and the inspecting officer, who had had as hard a day as the rest, took a square drink to make sure it was well made.

The Field State of Wounded (Army Form A 28) was then produced. Finally, orders were given to pack up and load, and on return to the main camp to unload. The company was then formed up, and I endeavoured to express to officers and men my congratulations on their work. It was certainly "hard to beat," as I told them. It was a pleasure to think that all who were at this training both enjoyed and appreciated what we may justifiably term high-level work.

Among those who were kind enough to come to witness the morning's work, besides Colonel Forde and other officers in camp, were Lieutenant-Colonel Kinnear and Captain Kidd, of the R.A.M.C. Territorial Force. Captain Morrison, an old officer of the Corps who joined some forty-six years ago, was also present. He is now Secretary of the Church Scripture Readers' Society, and was good enough to place a hut at the disposal of the officers' mess. There was also Mr. H. D. Stone, whose father, Dr. Stone, of Montrose, was a surgeon in the Army in or about 1865. After lunch, Captain Brook showed us his wheeled stretcher, which is well known in the Corps, and harnessed a pony to show its convertibility. We had some discussion about it. If it were made to weigh less, and could be easily packed and carried, a dozen would be very useful in a field ambulance, as to draw rather than to carry a patient is an easier matter and takes fewer men. It has more than once been suggested that infantry should wheel with them some of their equipment, and an adaptation of Captain Brook's stretcher would seem to meet the case. The messing of officers and men always

demands attention. A mess committee was formed and books were regularly kept as part of the instructional course. The N.C.O.'s and men were well looked after; store tents were drawn for them to mess in. Their messing book was produced at inspection. Last year sports were organised by Lieutenant-Colonel Austin. This year the men preferred a smoking concert, and the officers entertained the men with drinks and tobacco.

I must add a few lines about our brethren in the Territorial Royal Army Medical Corps. The advance made in the last two years in smartness and efficiency is beyond expectation. They will not mind my saying that the old bearer company was, as a rule, little more than a pleasurable picnic, whereas now both in the Highland and in the Lowland Divisions and Mounted Field Ambulances the work done is most admirable; the Administrative Medical Officer and Officer Commanding are much to be congratulated on the smartness, soldierly bearing, and discipline of the men. They were also well shod, a most important matter (it may be noted that all men should carry two pairs of boots to camp in our changeable climate, besides canvas shoes, if possible). Sanitary instruction was imparted to all, and field works were constructed. In the Lowland ambulances, under Lieutenant-Colonel Somerville, a tactical tour was studied and a written appreciation made of the fitness of certain factories for hospitals. In the Highland Field Ambulances, under Lieutenant-Colonel Kinnear, I saw dressing-stations developed with the same regard to detail as at Barry, and a waste-water system, the work of Captain Rorie, that would serve as a model. A passing stream had a bay dug out from which water was drawn for an ablution bench. The soapy water, after passing through a straw filter, was collected in an artificial pond, from which ran a fan-like series of irrigation channels. At the outer limit of these was a connecting channel. In this hardly any water was visible. The rest had percolated through the ground into the stream again, which showed no sign of contamination.

Reverting to the camp at Barry, I add an excellent syllabus devised and drawn up by Major B. H. Scott, and afterwards included in his official report. It may prove useful as a model scheme for a fortnight's unremitting hard work. The brunt of the duty of training fell upon him and on Captain McLennan, Lieutenant Hingston, Captain and Quartermaster Brook and Serjeant-Major Hill. In the CORPS NEWS at the end of this number will be found a list of all the officers, N.C.O.'s, and men present at the training. What impressed me even more than the excellence of

**SCHEME FOR INSTRUCTION OF NO. 13 COMPANY, R.A.M.C.  
ANNUAL TRAINING AT BARRY, 1909.**

August, 1909	6.30 to 7.30 a.m.	9 to 10 a.m.	11 to 12 noon	2 to 3 p.m.	Officers
16. Monday ..		Arrival in camp. Re-pitching certain tents.	Kit inspection .. ..	Work on Tactical Tour.	Work on Tactical Tour.
17. Tuesday ..	Company drill .. ..	Detail BEARER and TENT DIVISIONS Pitching and striking tents	Instruction—Field ambulance equipment and water cart (Brownlow's) Lecture—Camp sanitation	Mess meeting: officers' mess Instruction—Medical equipment of a field ambulance	Carnoustie-Forfar. Work on Tactical Tour. Ditto.
18. Wednesday	Stretcher and wagon drill	First aid .. ..	Lecture—Camp sanitation	Instruction—On drawing and checking stores	Work on Tactical Tour. Ditto.
19. Thursday ..	Company drill .. ..	Pitching and striking the OPERATION tent	Stretcher and wagon drill	Loading and unloading G.S. wagons and forage carts	Carnoustie-Forfar Tactical Tour, by Col. Corker.
20. Friday ..	Handseat drill; loading and unloading of wagons and carts	Route march. Formation of wounded, 9 to 1 p.m.	Search for and collection of wounded, 9 to 1 p.m.	Lecture—Organisation and requirements of a dressing-station and field ambulance	Carnoustie-Forfar Tactical Tour, by Col. Corker.
21. Saturday ..	Improvised stretchers; blanket bivouacs	The operation tent and its equipment	Inspection of field kits and C.O.'s inspection of camp	Half-holiday	—
22. SUNDAY		CHURCH PARADE.			
23. Monday ..	Company drill .. ..	Field training—Kitchens, latrines, urinals, various slop sinks, incinerators, and destructors	Inspection of field kits and C.O.'s inspection of camp	Instruction—Medical equipment of field ambulance	Lecture—On framing orders, by Col. Ford, R.F.A.
24. Tuesday ..	Stretcher and wagon drill, and loading G.S. wagons and cart	Lecture—On food contamination as a source of disease	Lecture—How to safeguard food from contamination	Lecture—Customs of war and Geneva Convention	Lecture—On Map Reading, by Col. Ford, R.F.A.
25. Wednesday	Bandaging and splints, and loading G.S. wagons and cart	Route march. Formation of wounded for and collection of wounded	Search for and collection of wounded	Lecture—Hints from the Russo-Japanese war	Lecture—Comparison of British and Japanese Field Establishments, by Major Scott.
26. Thursday ..	Extended movements for aid to and collection of wounded	Field training—Kitchens, latrines, urinals, various slop sinks, incinerators, and destructors	Search for and collection of wounded	Lecture—Medical aid from firing line to base	Aldershot Tactical Tour, by Col. Corker.
27. Friday ..	Lecture—Personal hygiene of the soldier	Inspection by P.M.O.: S.C. Marching order. Route march. Formation of dressing-station. Collection of wounded, &c., 8.45 a.m. to 1.15 p.m.	Route march. Formation of wounded for and collection of wounded	Unloading of G.S. wagons and forage cart	Aldershot Tactical Tour, continued, by Col. Corker.
28. Saturday ..	Struck hospital tents of field ambulance	Lecture—Sanitation and prevention of disease in camps	Inspection of field kits and C.O.'s inspection of camps	Half-holiday	—
29. SUNDAY		CHURCH PARADE			
30. Monday ..	Camp fatigues .. ..	Tents of Barry Camp Hospital struck	Filling-in of all field training works	Lecture—On checking and returning stores into store	Smoking concert for the men given by the officers.
31. Tuesday ..	Striking tents and camp fatigues	Camp fatigues. Lecture—On maps and map-reading	Out-station detachments left camp on return	Camp fatigues.	NOTE.—Of the men trained in signalling, the best were selected, and their training was continued whilst in camp.
1. Wednesday September	Remaining tents struck	Stores loaded on railway trucks	.. ..	Headquarter detachment left to re-join Headquarters, Edinburgh	

the work itself was the enthusiastic manner in which all ranks responded to the increased demand for work. I am sure this is due to their having realised that this higher training fitted them for war work of a special and distinctive character, work that would be a real and evident factor in the success of the schemes of the General in charge of operations, and would be recognised and understood by other corps, as indeed it actually was.

Setting free the men of the Corps for duty in camp by utilising the special reserve was a novel feature in practice, and in the future we may aim at a similar relief and also arrange interaction with St. John and St. Andrew's Ambulance Associations, from whom will be developed the Military Home Hospitals' Reserve.

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## SANITARY COMPANIES : TERRITORIAL FORCE.

BY LIEUTENANT-COLONEL R. H. FIRTH.

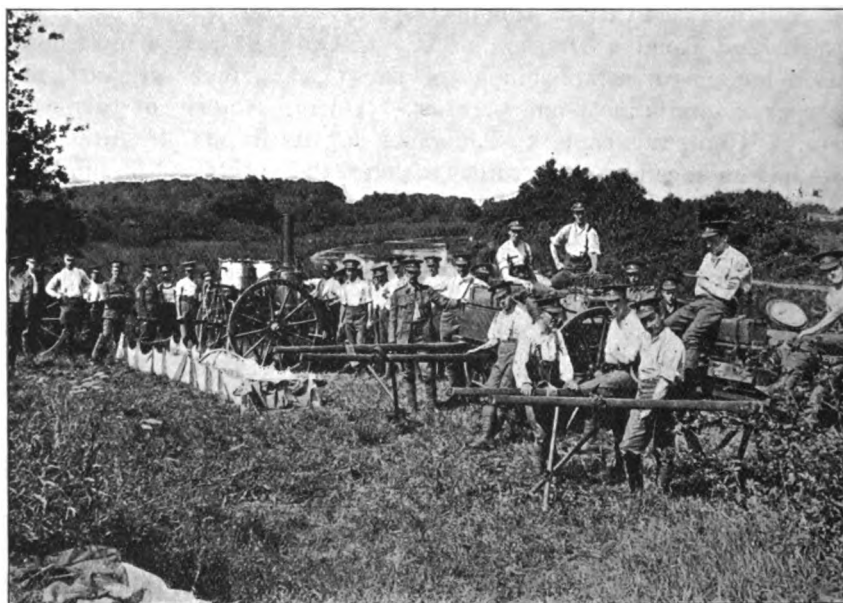
*Royal Army Medical Corps.*

SANITARY companies, as distinct units, are peculiar to the Territorial Force; the nearest analogue to them in the regular army being the sanitary sections, formed from the Royal Army Medical Corps, on mobilisation, for duty at posts on lines of communication. There are existing at present two sanitary companies in the Territorial Force; one (the City of London) belongs to the 1st and the other to the 2nd London Division. They are described as army troops, each having an establishment of five officers, four serjeants, five corporals and ninety-one privates. During August of this year No. 1 Company came to Aldershot for its annual training, and we had an excellent opportunity to gauge the merits and possibilities of this newly formed unit. Major L. T. F. Bryett was in command, assisted by Captain A. R. Owst; in addition, sixty-five N.C.O.'s and men attended camp during the fourteen days, the average daily strength being forty-nine.

We were early impressed with the intelligence and keenness to work and learn displayed by all ranks, and one of the serious problems was how best to employ this technical unit. Owing to the company not being attached to any division or working in co-operation with other troops in camp, it was impossible to utilise them on the duties which it is clearly their function to perform as an integral part of the Territorial Force. Major Bryett very kindly placed the company at our disposal, and we managed to fill up their days by a series of theoretical addresses or lectures at the School of Army Sanitation, combined with practical exercises in field work, corresponding, as far as possible, with service conditions. The theoretical work embraced the consideration of such topics as organisation and duties, camp sanitation, sources of water, methods of purifying water, personal hygiene and the peculiarities or difficulties associated with barrack life, disinfection, the mode of causation and principles of preventing the chief common diseases of soldiers, namely, venereal diseases, malaria, cholera, enteric fever, dysentery, and infective diarrhoea. The practical work was made to include the purification of water by clarification, by filtration, by chemicals, and by heat. In this latter connection opportunity was given to the men to familiarise themselves with the use of the filter-tanks in

general use, and with the new design of field water-sterilizer. The accompanying illustration shows the company engaged at this work on the banks of the canal. Camp and post sanitation was demonstrated by the routine construction of latrines, crematories and grease traps, suitable for field kitchens or ablution places. The disciplinary aspects of the training were met by daily drills and parades involving squad and company drill.

Although in respect of these details we have reason to think that the instruction and training given was both appreciated and considered satisfactory, still we have to recognise that much of it



can be covered during ordinary training at headquarters, and that the occasion of the annual assembly in camp should be made to cover ground and work for which opportunities do not present themselves during winter and at routine parades. The question is, how can this object be secured? We do not think it desirable to lay down any hard and fast rules, but put forward certain suggestions which indicate broadly the lines for future development; these may be considered under the four heads of *personnel*, duties, equipment, and annual training.

*Personnel.*—The officers of these companies should be men

specially trained and experienced in sanitary work. At least one should be an experienced bacteriologist and chemical analyst. The work of these officers must be regarded as analogous to that of a medical officer of health in civil life, and in their relations to the men serving under them their services should be utilised not only for supervising the work of the N.C.O.'s and men but in training the rank and file in the making of special inspections and investigations and generally carrying out of routine disease preventive measures.

As regards the men, these must be of a high standard of intelligence and recruited as far as possible from men following occupations having a special bearing upon sanitary efforts. The men must have a knowledge of squad and company drill, and be thoroughly grounded in first aid work, together with a sound knowledge of the principles and practice of hygiene generally and particularly in its application to military life. This training must and can be given at head-quarters by their own officers, who should ever bear in mind that the aim and object of their instruction is not so much to make the men into technical experts as to fit them to act with common-sense in regard to sanitary effort, should they individually be thrown upon their own resources. Judged by these standards, we found No. 1 (City of London) Sanitary Company an ideally constituted unit, and presenting material capable of development into the highest degree of efficiency.

*Duties.*—Assuming that the Sanitary Company consists of men trained to act as supervisors of and, under certain circumstances, executive agents for ordinary sanitary measures necessary for the preservation of the health of troops, it must be capable of division into sections and squads for the furnishing of small parties to supervise and even carry out such work as the preservation of water supplies from pollution, the purification of water, conservancy and the disposal and destruction of refuse. In other words, the details of the Sanitary Company, wherever placed, will act as sanitary police having duties analogous to, but involving more executive function than, those of the sanitary inspector in civil life.

In cases where troops are billeted on the civil population and towns or villages occupied, the sanitary supervision of these tenements will clearly fall within the range of duties demanded of a sanitary company. To this end their training should be made to embrace the rapid survey of premises required for occupation, and the development of a common-sense grasp of sanitary essentials and the quickest means of attaining them. The possibilities of good work under this head will be obvious.



In the event of it being necessary to establish disinfecting stations or set up plant for disinfection purposes, such work should be in the hands of the trained men of the Sanitary Company. Similarly, where special measures are necessary for coping with outbreaks of infectious disease, the Company should furnish men for these objects. In a limited sense, the unit might provide *personnel* for subordinate work in district or base laboratories under the Divisional Sanitary Officers. To this end, some training and instruction might well be recognised as a part of the duties of this unit. This need not be of a highly technical nature, but could well embrace the care of bacteriological outfits, elementary knowledge of bacteriological technique and the preparation of culture media. Only picked men should be instructed in these matters, but equivalent to at least seven or eight men per company.

*Equipment.*—It is evident that, if the foregoing summary is a legitimate conception of its duties, the equipment of a Sanitary Company must be designed to enable it to fulfil these functions. It was the absence of all equipment, except a filter-tank, with No. 1 Company when it came to Aldershot for its annual training that suggests serious criticisms. There can be no doubt this is a serious defect in these companies as organized at present. We suggest that every Sanitary Company should be in possession of the following: (a) A filter-tank as used in the service. (b) Some form of apparatus for sterilising water on the heat-exchange principle. (c) Reagents for the purification of water by chemicals and the improvisation of rapid clarification. Suitable reagents for this purpose would be alum, permanganate of potash, acid-sulphate of soda, bleaching powder, and tablets for the utilisation of iodine. (d) Picks and shovels, say six of each, for the preparation of latrines and crematories. (e) Apparatus and chemicals for rapid examination of water samples; a small Thresh's cabinet would meet the case. (f) Some form of approved disinfector, say a Thresh's portable apparatus; also a Mackenzie spray, together with common chemical disinfectants, such as formalin and sulphur dioxide. (g) A microscope and limited bacteriological outfit. This equipment should be held by the company on charge for instructional purposes, so that the men could be made familiar with details connected with their use and obtain a practical knowledge as to the manner in which they should be used.

*Annual Training.*—Having reviewed the constitution, duties and equipment of the Sanitary Company, and, by implication, indicated the general lines on which it seems desirable its routine

training should be carried out, there only remains to consider briefly on what lines its annual training should be developed. This annual training is but the culmination of the whole year's work and should be designed to test as far as possible how the men individually have profited by their training and how the unit as a whole is fitted to perform the duties it is intended to fulfil as a part of the Territorial Force. It cannot be too strongly urged that the mere going into camp and working at simple repetition of what they have been doing all the year is not what is the true object of the annual training. We would suggest that, on future occasions, the Sanitary Companies should undergo their annual training always in conjunction with a complete division, being utilised on such occasion to supervise the sanitation of all camps and, in fact, fulfil actually the *rôle* they are intended to play during invasion. This might be supplemented by the control, in a sanitary sense, of a line of communication from a hypothetical base, combined with the sanitary inspection for military purposes of a group of parishes. These would afford a practical insight for the men into actual conditions and, if followed to a logical conclusion, might enable the officers of the company to furnish a sanitary report to their military chiefs as to the sanitary condition of the area or areas. Concerted action on these lines by both the existing sanitary companies would in a few years lead to the collection of much needed information. It is not too late yet to formulate a scheme for practical work next year. The area chosen might well be made to fit in with or correspond to that to be used for actual military manœuvres. The co-ordination of military training on these lines is clearly the goal to which we should strive.

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## THE MEDICAL SERVICE IN INDIA.

BY MAJOR F. J. WADE-BROWN.

*Royal Army Medical Corps.*

THE Medical Service in India is composed of officers of the Royal Army Medical Corps and the Indian Medical Service; of assistant surgeons and hospital assistants of the Indian Subordinate Medical Department, and of men of the Army Hospital Corps and Army Bearer Corps.

The first two units are too well known to need further remarks here, but for the benefit of those who have not as yet served "out East" a short description of the remainder may perhaps prove useful and interesting.

*Assistant Surgeons* are men trained as military pupils, at Government expense, in Medical Colleges attached to the large hospitals in Bombay, Calcutta, and Madras. Their studies last for four years; the curriculum resembles that of the medical schools at home, and the examinations also. On becoming qualified they are posted for duty in British military hospitals and are gazetted 4th-class assistant surgeons. After five years in that rank they become 3rd-class assistant surgeons, and after a further seven years, and on passing an examination in professional subjects, they are promoted 2nd-class assistant surgeons. They remain in this class for seven years, when, if selected, they become 1st-class assistant surgeons, and attain the rank of senior assistant surgeon and the honorary ranks of lieutenant and captain when recommended and a vacancy occurs. The 4th and 3rd classes rank with subconductors of the various Indian departments, the 2nd and 1st classes with conductors, but taking precedence of these warrant officers.

The pay varies from 85 to 400 rupees per month :—

4th Class Assistant Surgeon	..	..	..	..	85 rupees.
3rd " "	"	"	"	..	110 "
2nd " "	"	"	"	..	150 "
1st " "	"	"	"	..	200 "
Senior Assistant Surgeon (Hon. Lieutenant)	..	..	..	..	300 "
" " (Hon. Captain)	..	..	..	..	400 "

There are also monthly allowances varying from 30 to 100 rupees.

The assistant surgeon at Army headquarters has a monthly allowance of 160 rupees, and the Assistant Secretary to the Principal Medical Officer, India, receives a consolidated salary from

Their pay is as follows:—

2nd, and 3rd grades; cooks, 1st, 2nd, and 3rd grades; water carriers, 1st and 2nd grades; and ward sweepers, 1st and 2nd grades.

These men are enlisted locally by the officers commanding station hospitals. They are at first on probation for two months, at the end of that time, and if of good character, they are regularly attested and receive all the advantages of hospital attendants. They are allowed to serve up to 55 years of age.

Their pay varies, according to the station they serve in, from 6 to 18 rupees a month, with batta money 1 rupee a month in certain stations, grain compensation according to market rates, and a clothing allowance of 15 rupees on enlistment, and 2 rupees 8 annas each succeeding quarter. Ward servants also receive 2 annas a day extra pay when in attendance upon infectious or contagious cases.

*Army Bearer Corps* is composed of havildars, naiks, sirdars, mates, and bearers. The first two are native N.C.O.'s drawn from regiments and serve in the various company offices. The sirdars, mates, and bearers are the proper men of the Army Bearer Corps; sirdars and mates are native N.C.O.'s; the bearers carry the dhoolies, four per dhoolie in peace time, six on active service.

These men are either enlisted locally by the company commander or by sending a recruiting party to work under the recruiting staff officer for Hindostani Hindoos at Lucknow.

Their monthly pay in rupees is as follows:—

					Pay		E. D. Pay		Batta.
Havildar	..	..	..	..	Regimental	..	10	..	—
Naik	..	..	..	..	..	..	5	..	—
Sirdar	..	..	..	..	9	..	—	..	1
Mate	..	..	..	..	8	..	—	..	1
Bearer	..	..	..	..	7	..	—	..	1

Local allowances, grain compensation and clothing money, as for the Army Hospital Corps, are also given.

These two corps perform general duty in station hospitals in time of peace, and on active service are attached to field medical units, corps, and regiments.

#### MEDICAL FIELD UNITS, &c.

*Mobilisation.*—For mobilisation purposes each divisional or independent brigade Principal Medical Officer keeps a field roster of officers of the Royal Army Medical Corps and Indian Medical Service, of the Military Nursing Service, and of the Army Hospital Corps. On mobilisation being ordered nominal rolls of the above are sent to the Principal Medical Officer, India, and to the

Principal Medical Officer of the Field Force. Medical officers and subordinates on leave are, if necessary, recalled—those in India, and also those on privilege leave out of India, by telegram sent by the Divisional Commander; others can only be recalled by the authorities at Army Headquarters.

Equipment is taken over by an officer of each unit, and when the *personnel* and material are complete in every way (except the ambulance transport) the officer commanding the unit reports the fact to his Principal Medical Officer for the information of the Divisional Commander, the Chief of the Staff, and the Principal Medical Officer in India.

Animals and vehicles are furnished at the base of operations, but full tentage is taken with each unit from its mobilisation station, and at the base orders are issued regarding the amount (full or otherwise) that will accompany the unit to the front. Field medical store depôts are mobilised in the same manner.

Hospital trains are arranged for by the military railway staff and the civil railway authorities, their staff and equipment by the Principal Medical Officer in India and the Chief of the Staff.

Hospital ships are provided by the Department of Military Supply, and fitted out under the superintendence of representatives of the Marine, Quartermaster-General's Department, and the Medical Department.

*Administration on Active Service.*—Para. 69 of the Field Service Manual (medical) states that Principal Medical Officers in the field are on (not attached to) the staff of the army; they are the responsible advisers of their respective General Officers Commanding, remain at headquarters, issue all orders respecting medical and sanitary matters, and under the General Officer Commanding control the medical and ambulance services of the force.

Divisional sanitary officers accompany their divisions in the same capacity, and staff surgeons are appointed to attend the officers of each division, brigade of cavalry, or brigade of all arms; these latter are separate appointments, and the officers holding them are not attached to corps.

The senior medical officers of brigades are also on the staff of their respective brigades, and their powers are similar to those of the Principal Medical Officer of a division.

The Principal Medical Officer of the line of communication controls all medical matters from the base up to, and including, the advance depôt; he arranges sites for general and other hospitals, the transport of the sick and wounded from rail-head to the base, and the movements of medical store depôts, &c. &c.

*Field Units.*—In some respects the Indian organisation somewhat resembles the British. For instance, medical attendance for regimental units is practically the same, and field hospitals resemble field ambulances in each having a company of the Army Bearer Corps attached to and working with it. Again, the “fast-moving” field hospital corresponds to the cavalry field ambulance, and the “slow-moving” field hospital to the field ambulance. The great differences are seen on the lines of communication. The Indian Medical Service has no clearing hospitals, no stationary hospitals, non-dieted field hospitals being used instead; no sanitary sections or squads, and no really organised ambulance trains, which in India are needed as much in peace time as in time of war, for transporting invalid men, women and children, to the troopships at Karachi and Bombay.

It has, however, an X-ray section, one section to each division. This is provided with “fast-moving” transport, and is a separate unit, having its own *personnel* and equipment.

Military depôts exist at the base for British and native troops, to which men discharged from hospitals in the vicinity are sent.

*Field Hospitals.*—It must be understood that brigades in India are mixed brigades, containing perhaps two battalions of British Infantry and two battalions of Native Infantry, or one British and three Native; therefore both British and Native field hospitals are required to accompany each division, and British and Native general hospitals are to be found together on the lines of communication and at the base.

The British and Native field hospitals are much alike, the only difference being that the British field hospitals are officered by officers of the Royal Army Medical Corps, assisted by assistant surgeons; the Native field hospitals by officers of the Royal Army Medical Corps, and Indian Medical Service, assisted by hospital assistants. The Army Hospital Corps works in the British field hospital and the Ambulance Bearer Corps in both British and Native hospitals. Half the cooks in these field hospitals are Hindus and half Mussulmans.

All officers, assistant surgeons, and hospital assistants doing duty with field units are mounted.

Each field hospital contains 100 beds, and is divided into four sections of 25 beds each. Each section is further divided into a “light” and a “heavy” subsection, the former being so equipped that it can be detached for work with small bodies of troops for a week or fourteen days.

### ERRATUM.

"The Medical Service in India."—The words "Royal Army Medical Corps, and" on page 556, lines 11 and 12 from the bottom, were not in the original manuscript.





Again, field hospitals are termed "fast moving" or "slow moving," according to the transport they possess. The fast-moving field hospitals are provided with mule transport; the latter with camel transport ("normal"), or draught bullocks or pack mules as "alternatives." Pukhals and field panniers are always carried on mules.

Field hospitals may be equipped on a "summer" scale or a "winter" scale, each with or without tents, as ordered.

There are four Royal Army Medical Corps officers and eight assistant surgeons with each British field hospital, and four Indian Medical Service officers and eight hospital assistants with each Native field hospital. The Army Bearer Corps attached to a British or Native field hospital consists of one sirdar, four mates, and 128 bearers.

The tentage for the sick varies according to the number of sections of a field hospital mobilised. General service 160 lb. tents are those used and are apportioned as follows:—

British Field Hospital					Warrant Officer's Hospital	Sick
1. Section	..	..	..	..	1	4
2. Sections	..	..	..	..	1	9
3. Sections	..	..	..	..	2	13
Whole Hospital..	..	..	..	..	2	18
Native Field Hospital					Native Officers	Sick
1. Section	..	..	..	..	1	4
2. Sections	..	..	..	..	1	9
3. Sections	..	..	..	..	1	14
Whole Hospital..	..	..	..	..	2	18

The ambulance transport consists of:—

	One Section	Whole Hospital
Dandies .. .. .	5	20
Ambulance tongas .. .. .	5	20
Riding mules or ponies .. .. .	20	80
Army Transport cart, bullock, draught .. .. .	—	1

Field hospitals on the lines of communication are only provided with one dandy, six bearers, and one tonga (or four riding mules) per hospital or detached section.

As regards medical and surgical equipment, it is impossible in a short article like this to describe it. It varies so much according as it is required for a light subsection or a heavy subsection, or for a whole field hospital; reference should therefore be made to Appendix 5 of the Indian Field Service Manual (medical).

Field hospitals, if they become filled with sick and wounded and unable to move, become hospitals on the lines of communication and so under the administration of the Principal Medical Officer on the lines of communication.

*General Hospitals* are administered and worked in the same

manner as station hospitals in time of peace. Each hospital contains 500 beds divisible into five sections of 100 beds each. The *personnel* of a British general hospital consists of 20 officers of the Royal Army Medical Corps and 20 assistant surgeons, 1 lady superintendent and 9 nursing sisters, 20 nursing orderlies, 100 ward servants, 20 bearers, 25 cooks, 25 water carriers, 40 ward sweepers, and 40 dhobies, also a number of men for conservancy purposes.

For a Native general hospital of 500 beds the *personnel* consists of 13 officers of the Indian Medical Service, 1 assistant surgeon and 20 hospital assistants, 5 hospital havildars, 40 ward orderlies, 20 cooks, 20 water carriers, 20 ward sweepers, 10 bearers, 10 dhobies, and men for conservancy, supply and transport purposes.

The tentage for a British general hospital and a Native general hospital is practically the same, viz. :—

TENTS, BRITISH PRIVATES.

British Officers' Hospital	..	..	..	..	20
Native .. ..	..	..	..	..	10
Surgery .. ..	..	..	..	..	5
Sick .. ..	..	..	..	..	60
Special Cases .. ..	..	..	..	..	10

*Field Medical Store Depôts* are placed along the lines of communication as required. They supply corps units and hospitals with medical and surgical stores, and are replenished from the general medical store depôts at rail-head and the base or from the nearest place.

*Medical Store Dépôt.*—*Personnel*: Field medical store dépôt—1 senior assistant surgeon, other establishment, 7. General medical store dépôt for one division of all arms—1 medical officer, 2 assistant surgeons, other establishments, 10, and a corresponding increase for two or three divisions.

Hospital trains are converted bogie railway carriages. Each train normally consists of 13 bogies, one for British sick officers, four for British sick and five for native sick, one for medical officers and servants, one for hospital assistants and native *personnel*, and one for British N.C.O.'s and men and assistant surgeons. Front brake for guard, kits, linen, and charcoal; rear brake for guard, stores, and medical equipment.

*Personnel* of hospital train :—

Medical Officers .. ..	..	..	..	..	2
Assistant Surgeons .. ..	..	..	..	..	2
Hospital Assistants .. ..	..	..	..	..	2
Nursing Sisters .. ..	..	..	..	..	2
British N.C.O.'s .. ..	..	..	..	..	2
„ Privates .. ..	..	..	..	..	8
Native Establishment .. ..	..	..	..	..	26

*Hospital Ships for British Troops* are organised, worked, and dieted as general hospitals and are equipped for 100, 150, or 200 beds.

*Personnel :—*

		100 beds	150 beds	200 beds
Royal Army Medical Corps, Officers	..	3	4	5
Assistant Surgeons..	..	4	5	6
Qualified Assistants	..	3	6	7
Ward Servants, Cooks, Sweepers	..	16	24	32
Pack Store Sergeant	..	1	1	1
„ „ Privates	..	2	3	4
Writers	..	1	1	2
Supply and Transport	..	15	20	22

*X-ray Section Establishment.*—One officer, 1 assistant surgeon, 15 public followers, 4 private servants.

In concluding this article I would make the following remarks :—

The Indian Nursing Service, even in time of peace, is inadequate. On account of the large number of cases of enteric fever, dysentery, malaria, liver abscess and other severe diseases, India is the one place in the whole world where a really good nursing service is required. At present there are only about ninety nursing sisters for the whole of India and Burmah ; there are none in Aden. These nursing sisters are assisted by regimental orderlies, men drawn from the regiments stationed in the garrison, who receive a small amount of training in a station hospital. According to an Indian Army Order (506, October 6th, 1907) they are allowed to do duty in a hospital for a period of six months, and are then returned for regimental duty for at least three months before resuming their nursing work for a further period of six months, and so on.

No one would wish to belittle the regimental nursing orderly—he is, as a rule, a well-behaved, conscientious, hard-working man, who does his utmost for those entrusted to his care—but nursing is not his vocation.

Considering the number of serious medical cases, in which so much depends upon good nursing, one of four things is necessary :—

(1) A large increase in the Queen Alexandra's Military Nursing Service in India ; or

(2) An amalgamation of the two nursing services, the Home and the India ; not a difficult matter, as the Indian Nursing Service only nurse British troops ; or

(3) Retention of time-expired regimental nursing orderlies, and the formation of a Royal Indian Medical Corps ; or

(4) That the Nursing Section of the Royal Army Medical Corps be brought into India, and a Sanitary Corps as well.

What is needed during peace time is doubly or trebly necessary when the "ultimatum" has gone forth and the "fall in" has sounded. The house cannot be put in order too soon.

The Field Service Organisation is good in its way, but is antiquated, does not go far enough, and to officers of the British Service is somewhat strange.

Fighting in the East resolves itself into fighting in the hilly frontier, on the sandy plains of Somaliland and the Hinterland of Aden, in India itself perhaps, or in some other country, such as South Africa or China. For the first special units with mule transport, Hathaway's crutches and dandies<sup>1</sup> might be kept mobilised at Peshawar, Rawal Pindi, and Quetta; for the second special units with camel and mule transport at Bombay and Aden; for the third and fourth the Indian Organisation should at once be brought into line with British methods, field ambulances, clearing hospitals, sanitary units, line of communication units, &c., &c., being arranged for, ready for any intrinsic emergency or for service in other parts of the globe, when, as in South Africa, they might be brought into contact with the well-organised and well-trained British Medical Service.

The alteration in designation of medical officers of the administrative staff of the British Army has certainly not met with success.

The title "Director of Medical Services" is the only one that is at all satisfactory. The titles "Deputy-Director of Medical Services" and "Administrative Medical Officer," are not understood by combatants and by very few non-combatants. The old titles "Principal Medical Officer, Line of Communication," "Principal Medical Officer Division," "Senior Medical Officer Brigade" (still retained, but why not altered like the other, one fails to see), and still in use in the Indian Army, are understood by everyone, and cannot be improved upon. Simplification on active service is everything, and little is gained by complicating matters in this way.

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<sup>1</sup> The bearers of these dandies should be long-service men and well trained. Short-service men do not get hardened to the work, are indifferent, and of very little use on service or manœuvres.

## NOTES ON MILITARY MAP READING.

BY MAJOR A. P. BLENKINSOP.

*Royal Army Medical Corps.*

THE following notes on military map reading formed the basis of a series of lectures delivered at the Royal Army Medical College, to the lieutenants on probation, Royal Army Medical Corps. It is hoped that they may be of some interest to a wider audience than that to which the lectures were given. A good knowledge of map reading is essential to all officers who may be called upon to work out problems in medical strategy and tactics, and senior officers must have found this to be so when they have been ordered to take part in staff rides or to evolve schemes for medical administration and organization in the field. No originality is claimed for the observations made in these notes. They are largely compiled from various official and non-official text-books, which have been collected with a view to meeting the requirements of military medical officers. The following remarks made in the introductory lecture will indicate the scope of the subsequent teaching. "In your future career you may be called upon to select sites for general military camps, for dressing stations, field ambulance camps, hospitals, &c. You may also be required to march men or move ambulance wagons from one point to another in a country which is not familiar to you, and to do so independently of other troops. Then, again, you should be in a position to tell from a map the routes (whether by road, rail or water) by which sick and wounded can be moved with the greatest convenience and with the most comfort to the patients. A knowledge of military map reading will assist you in all these cases, and will also help you to solve various other problems of a similar nature."

In the service one has to deal with: (1) military maps; (2) field sketches; and (3) panorama sketches.

(1) *Military maps* are the proper work of a trained surveyor, using special instruments and elaborate appliances, with unlimited time at his disposal and aiming at minute accuracy.

(2) *A field sketch* is a sketch of the ground, such as an officer or N.C.O. of average attainments ought to be able to make, working with such instruments and under such conditions regarding time, weather, &c., as generally exist in the field.

(3) *A panorama sketch* is a landscape sketch representing the country in elevation instead of in plan. It is useful to illustrate a report and may add considerably to its value and clearness.

## SCALE.

Before reading a map, the scale of it should be carefully noted, and the space occupied by a mile should be observed:—

(1) In the United Kingdom, India and Canada scales on the map are usually expressed in words showing the relation between inches on the map and miles on the ground; thus, 1 inch to 1 mile, or  $\frac{1}{2}$  inch to 1 mile.

(2) Foreign maps and maps of the British African Colonies and possessions are constructed on scales which bear the proportion of 1 to some multiple of 10, such as 1 to 250,000, or 1 to 1,000,000. The scale adopted for the military map of South Africa is 1 to 250,000.

These scales may be represented as fractions, thus, a scale of 1 inch to 1 mile may be represented by  $\frac{1}{63360}$  (there being 63,360 inches in a mile); or a scale of 1 : 100,000 (= 1 centimetre to 1 kilometre), may be shown as  $\frac{1}{100000}$ . The fraction in each case is called the *Representative Fraction* or R.F., and means 1 unit in the map (numerator) represents a certain number of similar units on the ground (denominator). The numerator of a R.F. is always 1 unit.

Given the Representative Fraction, to construct a scale in miles:—

(1) If the scale is  $\frac{1}{63360}$  or larger (*i.e.*, with a smaller number in the denominator), multiply the R.F. by 63,360. This gives the number of inches to the mile. Thus with a R.F. of  $\frac{1}{100000}$ :—

$$\frac{1}{100000} \times 63,360 = 6.33 = \text{inches to 1 mile.}$$

(2) If the scale is smaller than  $\frac{1}{63360}$  (*i.e.*, with a larger number in the denominator), divide the denominator of the R.F. by 63,360. This gives the number of miles on the ground represented by 1 inch on the map. Thus with R.F. of  $\frac{1}{250000}$ :—

$$\frac{250000}{63360} = 3.95 = \text{miles to 1 inch.}$$

The measure of length which a scale is to show, whether feet, yards or miles, is termed the *Unit of Measure*.

Maps for manœuvre areas have generally been drawn to a scale of 1 mile to 1 inch. Recent regulations, however, state that in future the scales will usually be those employed in maps which would be issued on field service, that is to say:—

(a) At home  $\frac{1}{2}$  inch to 1 mile ( $\frac{1}{4}$  inch in Ireland).

(b) In the Colonies  $\frac{1}{2}$  to  $\frac{1}{4}$  inch to 1 mile. Maps of a larger scale (up to 6 inches to 1 mile) are used to show:—

(1) The details of camping grounds.

(2) The distribution of troops in billets.

(3) Siege operations.

Large scale field sketches are also employed to meet the above requirements, or to display the topography of a village or town necessary to provide for its attack or defence, or to represent the results of a reconnaissance of a road, river, defensive, or outpost position.

"Manœuvre maps should be reproductions of the Ordnance survey, and should show the boundaries of the manœuvre area, ground out of bounds and such other information as may be considered desirable. . . . The sites of available camping grounds and bivouac spaces may be indicated on manœuvre maps by numbers enclosed in circles, or some other conventional sign allowing of easy reference. . . . Tracings from the Ordnance map on a scale of 6 inches to 1 mile of the camping ground or bivouac spaces should be made and issued to the commanders and staff concerned" (Training and Manœuvre Regulations, pp. 53 and 58).

*To Construct a Scale.*—If no scale is shown on a map, a R.F. may be obtained if the distance between two points shown in the map is accurately known. Failing this knowledge, the distance between two points shown on the map should be measured, by pacing (a pace = 30 inches) or otherwise, and compared with the distance between the same two points on the map. Then the R.F. can be worked out by showing the distance on the map in inches as the numerator, and the distance on the ground in inches as the denominator, and reducing the fraction until the numerator is represented by 1 unit.

"Suppose we have a map in which R.F. is  $\frac{1}{100000}$ . Here the R.F. shows that 100,000 inches, or *roughly*  $1\frac{1}{2}$  miles, are represented by 1 inch; therefore, evidently 9 miles will require a line *about* 6 inches long. The exact length is found in the usual manner, thus: 100,000 inches :  $9 \times 1760 \times 3 \times 12$  :: 1 inch :  $x$  inches whence  $x = 5.7$  inches."

"Take a line 5.7 inches long from the protractor and divide it into nine equal parts, each part will be 1 mile. Divide the left part into eight equal parts, each will be 1 furlong" (see fig. 1).

"It may be observed that if the representative fraction is marked on a plan, the scale can be understood, and the plan, even though it be a foreign one, used by anyone. Without the R.F. it might be useless, unless the exact distance between any two points on the plan is known, or can be established by actual measurement on the ground, in which case the distance measured is represented



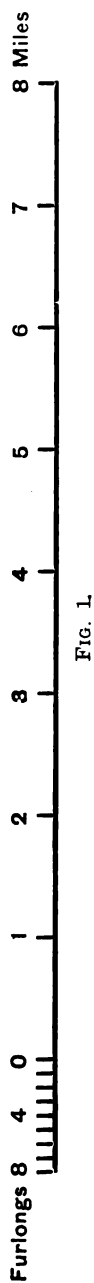


FIG. 1.

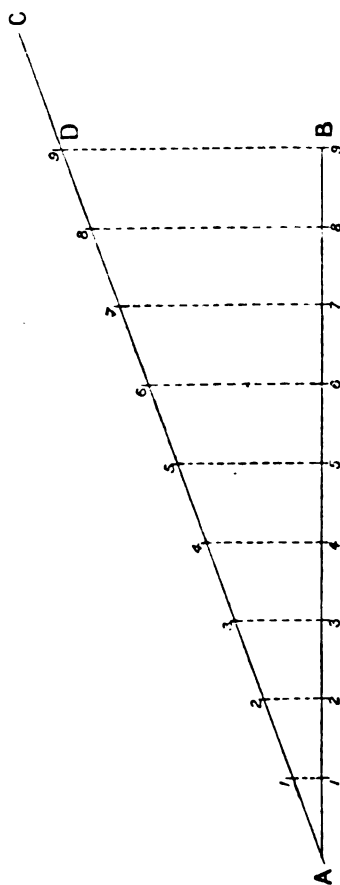


FIG. 2.

by so many inches on the plan, whence the R.F. may be inferred and a suitable scale constructed" (Notes on Map Reading for use in Army Schools").

A ready method of dividing a straight line into any number of equal parts is demonstrated by the following example (see fig. 2).

It is required to divide the straight line AB into nine equal parts. From A draw a straight line AC, making an angle of about 20 degrees with AB. Set off on AC nine equal divisions, making each of them, by estimation, nearly equal to  $\frac{1}{9}$  of AB. Let D be the last point marked on AC. Join DB. Then from the other points marked on AC draw straight lines to AB parallel to DB. AB will be divided into nine equal parts. (See Euclid, 10th proposition, vi. book.) DB should meet AB as nearly as possible at a right angle.

The following measurements may be of use in map reading, and even in the construction of scales, if a protractor or an inch measure is not available :—

- (1) The diameter of a halfpenny is 1 inch.
- (2) The lines on a sheet of ruled official foolscap are  $\frac{1}{3}$  inch apart.
- (3) A man's visiting card measures 3 inches by  $1\frac{1}{2}$  inches.
- (4) If the last joint of the thumb is flexed to a right angle and placed, nail downwards, on a plane surface, the longitudinal distance covered varies from  $1\frac{1}{4}$  to  $1\frac{1}{2}$  inches in different individuals.

The advantage of a scale showing miles to an inch, or inches to a mile, is that the eye can easily recognise the length of an inch on paper, and thus rapidly estimate distances on the map, even without measurement.

It is good practice to compare maps of the same district, but of different scales, with the actual ground which those maps represent; so that afterwards, knowing the scale of a map, one can construct a mind-picture on the ground portrayed before one has an opportunity of inspecting it. A map should not be looked upon as a mere plan or diagram, but as a means of conveying to the mind an actual picture of the ground which it represents. One should see in one's mind's eye the hills and valleys, roads, water-courses, canals, railways, woods, parks, and other features of the country delineated.

*(To be continued.)*



## Clinical and other Notes.

### A NEW CREMATOR LATRINE SYSTEM.

BY CAPTAIN F. HARVEY.

*Royal Army Medical Corps.*

THE disposal of the excreta of any community under conditions in which water carriage is out of the question is an ever fertile source of trouble, difficulty, and danger. Therefore, any new departure which, if successful, would tend to revolutionise all the existing methods must, of necessity, be worth our most careful consideration. I thus make no apology for bringing forward a new scheme which appears practicable, simple, economical, and might, from a hygienic point of view, be considered perfect.

To refer briefly to existing methods, the situation may be summed up under two headings :—

- (1) Trenches.
- (2) Buckets.

With regard to the former, I think everyone of any experience in the matter is now agreed that the short, parallel trench system, which I strongly advocated in 1906 ("Sanitary Notes," JOURNAL OF THE ROYAL ARMY MEDICAL CORPS), has so many advantages over the long, deep system, that the latter need scarcely now be considered at all. Further, I think that in any case the trench system can only be considered as applicable to camp sites of less than one month's duration, and, generally speaking, half that time, and then with certain other special limitations as to soil, site, &c.

Briefly to sum up the advantages of the short trench :—

- (1) Practically no fouling of the sides.
- (2) Less liability to flooding.
- (3) The fullest advantage taken of the vital soil layer.
- (4) Reduction of flies to a minimum.
- (5) The only method for troops on the move.

The disadvantages are :—

- (1) The large area of ground involved.
- (2) The necessity of a daily or bi-daily shift.

With regard to (1) and (2), the "frontage," taking a 7 per cent. basis, is directly proportional to the "x" strength, as a ratio of  $\frac{7}{25}$  by  $x$  = feet (assuming the usual 1 foot width of trench, 3 feet interspace, and 3 feet depth from before backwards). The "depth" is proportional to the number of shifts in a given number of days, the latter representing directly the number of feet; that is, assuming the space between each

trench is utilised, there being two, four, &c., moves every three, six, &c., days, which is the average rate of progression, using an 18-inch excavation. The area of ground required is then easily calculated. (The usual frames and seats on runners are easily moved.)

For example, 250 men are in occupation for fourteen days. Then  $\frac{7}{25}$  by 250 by 14 equals the area in square feet (or a rectangle of 70 feet by 14 feet). This allows for ten shifts. In a large camp, however, of restricted site and prolonged duration, the limitations of this method are obvious and of necessity one turns to the "bucket" system.

Here, again, we have all the well-known dangers and difficulties, first and foremost of which I would place our great sanitary enemy, "the contractor." As before, the only methods that we need consider are three:—

- (1) Dry earth.
- (2) Wet antiseptic.
- (3) Destruction.

The former, as everyone is painfully aware, involves removal by the contractor and burial on some system or other, usually unsatisfactory and insanitary, over which we have little real control and which in tropical stations especially, is often an exceedingly serious question, added to which are all the usual disadvantages connected with buckets.

Colonel Wardrop (*JOURNAL OF THE ROYAL ARMY MEDICAL CORPS*, June, 1906) remarks, and I think his opinion of that date must be taken as voicing the then sanitary opinion of India, under the heading of "Latrine Infection in the Enteric Fever of India": "Day by day the fact is being forced upon us in India that our greatest sanitary need is a more perfect latrine and a better disposal of the night soil."

His conclusions are overwhelmingly in favour of an antiseptic system instead of dry earth; that is to say, the addition of some liquid antiseptic directly to the excreta, which are afterwards removed and buried as usual. Up to then this view appeared to have been gradually gaining ground, judging from the literature on the subject. But from this date onwards destruction appears to have gained the front place in our sanitary ideas, and it is interesting to note that some still hold to the addition of antiseptics, although destruction is the object in view, which would appear to be an economic fallacy.

It is under the heading of destruction that I wish to bring forward a new, universal Cremator Latrine. I suggest that such a system would take us a distinct step further forward by the use of a "destructible receptacle," coupled with the most "perfect incinerator" that has yet been devised.

I assume that we are only considering the necessities of fixed semi-permanent or camping grounds regularly occupied for definite periods,

<sup>1</sup> In this case fifteen, the nearest multiple of three must be taken, as the trenches are 3 feet.

and of civil or military communities under Colonial or tropical conditions (especially in India or West Africa), and in places where, as I have said before, water carriage is out of the question.

In talking of a portable destructor I mean a contrivance that is easily transported in the same sense and under the same limitations as the rest of an ordinary camp equipment, and as such would be eminently applicable to the necessities of the Territorial Army in peace, or mobilised, or at the regular training and musketry camps; where there is no reason why we should be ten years behind the times in clinging to our old dry-earth buckets.

To refer to some of the already tried destruction systems, the following may be mentioned:—

(1) *The (American) Smith Camp Crematory* (Munson).—Without discussing this further, one notes that one machine for 200 men weighs about 3 tons. The system is that of a number of hoppers around a central furnace. Camp refuse is dealt with at the same time.

(2) *The (American) Bissel Incinerator Wagon* (Munson).—For excrement and garbage. This is equally impracticable.

(3) *An Improvised Incinerator*, described by Lieutenant R. G. F. Tate, R.A.M.C., from Dalhousie (JOURNAL OF THE ROYAL ARMY MEDICAL CORPS, May, 1909), in which dry and wet refuse are reduced to a dry ash, and which is portable enough for manœuvres. It is not stated how the system is worked when dealing with excreta, and with regard to the use of buckets, whether any inflammable material is used instead of dry earth, what amount of excreta that can be dealt with regularly, and whether any offensive odours are present. According to Lieutenant Tate's statements, this destructor, which might be described as of a cradle or bed-cot extensible type, was very successful in dealing with the dry and wet refuse at his station in India.

(4) *A Note on the Incineration of Fæces in India*, by Captain Safford, R.A.M.C. (JOURNAL OF THE ROYAL ARMY MEDICAL CORPS, July, 1909). This appears to be a rectangular brick affair, cheap in construction, producing little smoke, and inoffensive in operation; fuel, however, is a difficulty. One would be placed behind each latrine, and the buckets filled with dry leaves. This, of course, is not a system that could be described as portable or of possible universal adoption, and would be quite inapplicable to our camps at home, as, indeed, would any of the following systems:—

(5) *McCall Incinerators*, mentioned by Lieutenant-Colonel W. G. (Macpherson, C.M.G., in an article on the "Panama Canal" JOURNAL OF THE ROYAL ARMY MEDICAL CORPS, September, 1908). Again there is something of the Smith crematory system; metal plates in latrine boxes, which are heated by a fire placed beneath them. The plates and the great cost of fuel required appear to be serious difficulties. Lieutenant-Colonel Macpherson suggests that combustible

plates of cardboard would be an improvement, and states "they have given great satisfaction and seem to have come to stay." It must be noted that destruction of refuse does not enter into combination with this system.

(6) Lieutenant-Colonel H. A. Haines (THE JOURNAL OF THE ROYAL ARMY MEDICAL CORPS, January, 1908) describes a cheap destructor of bricks, mud, and some improvised ironwork. He advocates the use of kerosene oil smeared on the insides of the pans, and the addition to the excreta of 4 per cent. carbolic acid and sawdust.

(7) Lieutenant-Colonel W. A. Morris (THE JOURNAL OF THE ROYAL ARMY MEDICAL CORPS, April, 1909) in an article, "The Treatment of Excreta in India by  $\text{HgCl}_2$ , and Incineration," uses the same type of incinerator. Firewood and horse litter are used to start the fire, and rubbish is employed to keep it going. This officer advocates kerosene oil for the floors and woodwork of the latrines as a preventative against flies; and the urine is boiled in a boiler enclosed in the incinerator.

(8) Lieutenant-Colonel B. Skinner, M.V.O. (THE JOURNAL OF THE ROYAL ARMY MEDICAL CORPS, April, 1909), carries out much the same principle, and uses "Fuel, rubbish, dead leaves, sweeping and stable litter for incineration for the complete combustion of excreta and urine." This officer places litter or sweepings and leaves in the latrine pans, and fills the urine receptacles two-thirds full with the same materials.

(9) Lieutenant-Colonel G. Allen (THE JOURNAL OF THE ROYAL ARMY MEDICAL CORPS, November, 1905) only aims at sterilisation of mixed liquid and solid sewage, which has afterwards to be trenched in as usual, by raising it to "60° C., and maintaining the temperature at this height for thirty minutes." He advocates the use of weak carbolic in the pans as a preventative against flies and odours. Considerable amount of fuel is required, and the machine is really an improvised metal boiling apparatus. This method would appear to be limited to dealing with only comparatively small amounts of sewage.

(10) Lieutenant-Colonel Cree (THE JOURNAL OF THE ROYAL ARMY MEDICAL CORPS, May, 1907) used a built destructor, in which he found "fireproof bricks a necessity," and wood or coal fuel. Crude kerosene oil was used in the pans with the excreta, and the latter were immediately transferred to a common receptacle by the attendant sweeper, prior to incineration.

To "summarise" the vital points in any system of destruction would appear to be as follows :—

- (1) The receptacle.
- (2) The addition to the excreta.
- (3) The type of incinerator, its efficiency and portability.
- (4) The cost and facility of operation and the inclusion in the scheme of refuse destruction.

Taking these points in detail :—

(1) *The Receptacle*.—The system which I now advocate eliminates altogether the pail or any form of permanent receptacle. The cost of acquiring, maintaining, storing, transporting, and cleansing a large number of pails or pans is altogether done away with. In their place I use under each latrine seat, on a slide or suspended, specially manufactured rectangular boxes of suitable dimensions, or tarred calico bags, the former being set up from flat sheets; either is easily transportable. The space occupied by about a gross and a half of the bags or the flat sheets packed would be something like 4 by 3 by 3 feet (36 cubic feet), or the dimensions of an ordinary fair-sized packing case.

In the case of sheets, if not already waterproofed on one side, they would be brushed over with heavy oil before being set up, the setting up merely involving turning up of the sides and ends, which are held in position by the addition of some very simple, inexpensive rivet, clip, or fastening. The nature of the material used would be a form of rough *papier mâché*, or other suitable and cheap material, such as compressed and stiffened tarred felting, or woollen shoddy, a cheap trade refuse from Yorkshire, worked up in sheets, tarred and compressed. The cost, taking into consideration large contracts, might be as low as 10s. per gross.

When full the box or bag is removed from under the seat and placed directly inside the incinerator. A wire-basket frame, with the ends and sides that would fall down like a child's bed-cot, would hold the boxes when in position, but would be dispensed with in the case of bags, or if the material were found to be sufficiently strong to stand up (in the box form) for, say, forty-eight hours on the slide without giving way. Wire frames or trays would in any case facilitate handling and removal to the incinerator.

(2) *The Addition to the Excreta*.—Sawdust, wood shavings or chips, dried leaves, crushed pine needles (as suggested by Major R. J. Blackham, referring to the "Goux System and its Application to India," *THE JOURNAL OF THE ROYAL ARMY MEDICAL CORPS*, June, 1906), or peat moss litter in small quantities, would be placed in the bottom of each box, and again sprinkled on, when nearly full, once or twice. In addition, two or more sprinklings daily of some cheap crude oil of the paraffin series would facilitate combustion and keep away flies. The small amount of urine usually passed during evacuation would be easily taken up by the peat moss litter. In any case this would not be a serious difficulty, judging from the usual appearance of the average bucket.

(3) *The Type of Incinerator*.—No extemporised or locally-made amateur brick or mud incinerators are worth considering for this scheme. The best types undoubtedly are small semi-portable incinerators, manufactured by a certain well-known Destructor Co., who are recognised specialists at this work and have been making destructors for years. They are perfect fume-cremating furnaces, and to burn excreta cheaply and satisfactorily it is absolutely necessary to have the finest possible type of

furnace. These are made in various sizes, are comparatively inexpensive, will last for years with reasonable use, and are as transportable as the rest of the usual camp equipment. Their weight and bulk compare very favourably with the equivalent number of buckets required. Taking the daily dry combustible refuse at about one-third of a ton and the treated and boxed excreta at about one-sixth of a ton for a camp of 1,000 men, two destructors each costing about £6 10s., and weighing about 8 cwt. (or one double the size), would with a careful stoker cremate the whole to a fine ash if worked continuously. The stoker is very important; no casual regimental man told off for the job would do, but a pensioner with experience in stoking, under the orders and paid, if possible, by the medical officer in charge of the sanitary arrangements of the camp, a regimental pioneer, or else a specially interested man of the Royal Army Medical Corps Sanitary Section would be required. I have seen these destructors in operation burning excreta mixed with sawdust, and the results obtained were apparently perfect, a fine ash being produced and the absence of any offence being most remarkable.

CAMP OF 1,000 MEN FOR ONE MONTH.

<i>Bucket and Dry Earth System.</i>				<i>New Cremator Latrine System.</i>			
Contractor at usual rates for buckets .. ..	£10	0	0	No. 4 type (or one No. 3), two destructors, £6 10s. each; capital outlay divided over 3 camps in equal increments (without interest) .. ..	£4	6	8
Ditto for refuse .. ..	2	10	0	* Cost of transport of one or two destructors, maintenance, and storage.			
				6 bales of peat moss litter at 5s.	1	10	0
				10 gals. of crude paraffin ..	0	10	0
				6 gross of cremator latrine bags or boxes at 10s. per gross (delivered) .. ..	3	0	0
					9	6	8
				Balance to wire frames or (?) labourer .. ..	3	3	4
					£12	10	0
					£12	10	0

\* Assumed to balance, but probably the destructors would cost less.

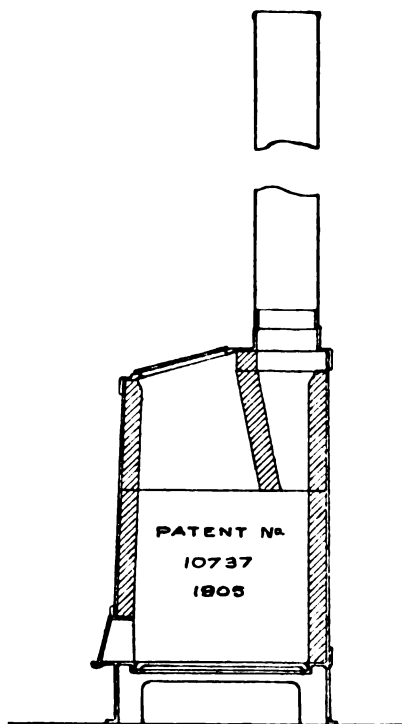
(4) *The Cost and Facility of Operation.*—For facility of operation the incinerators would be placed close to the latrines in the camp. The removal of each box or bag by hand would involve very little time or labour, the removal would be cleanly and easily controlled, and the “*contractor would be non-existent.*” The cost without experience is difficult to estimate, but taking into account the enormous advantages from a sanitary point of view, the elimination of the contractor question, the economic advantage, the feasibility of the universal adoption of this scheme, and its application to all and any camps where the usual latrine



frames and seats are allowed, whether for trench or bucket system, I think that any slightly increased expense is more than outweighed. It is more probable, however, that a financial saving would be effected in the long run. It must be noted also that the destruction of refuse, which is so extremely desirable, is included.

A comparative estimate might appear something like that on p. 571.

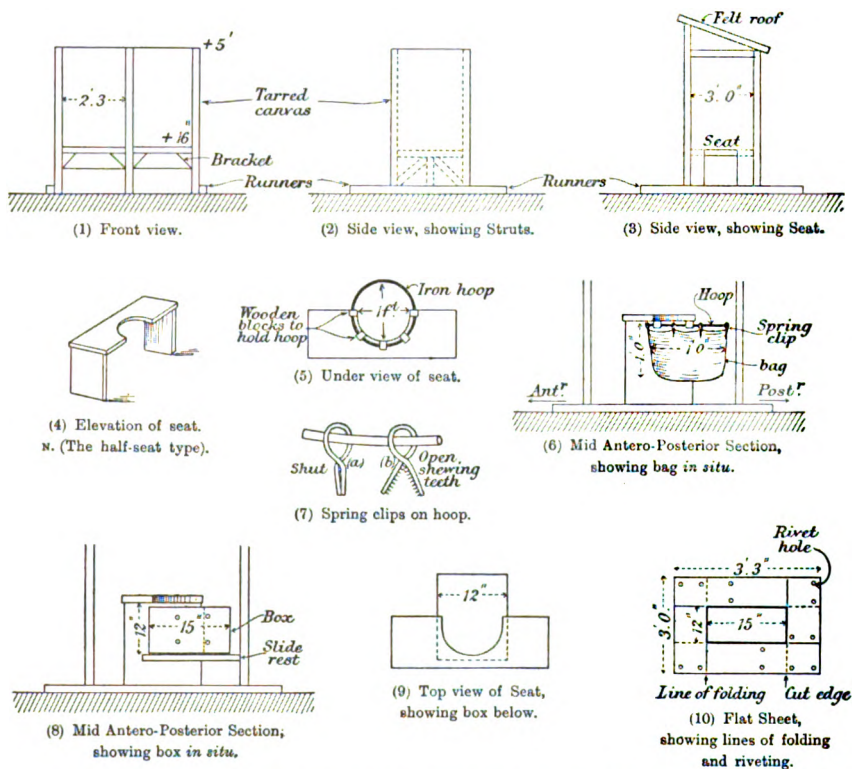
With reference to this estimate, it might be noted that at a camp of about 1000 population lasting three months, such as exists in



TYPE OF A "DESTRUCTOR" SUITABLE FOR THE CREMATOR METHOD.

several places, for example, in the Southern Command at Wool, Wills-worthy, Wedgnoek Park, &c., the destructor would pay for itself the first year; the second year it would be saving money. This money saved would go towards paying for certain minor accessories not previously thought of, and which would develop with experience, such as a frame with corrugated zinc roofing to stack temporarily the full cremator boxes or bags waiting for their turn to be burned, and to form a shelter for the destructor plant and dry refuse, &c.

It should be noted that I have not, up to the present, attempted to deal with the urine in this scheme. Urine does not turn into dust, and does not breed or attract flies. In any case, if thought expedient, a few drops of crude paraffin oil applied to each tub would form a film on the surface lasting sufficiently long for the discouragement of flies; and some powerful



#### AN ADAPTATION OF THE AUTHORISED WOODEN LATRINE FRAMES FOR CAMPS.

NOTE.—The bags (6), when full, are simply detached from the iron hoops (5) under the latrine seats by pinching the teethed spring clips (7). The mouth of each bag is closed, with tarred string (previously looped ready) and then placed directly in the furnace. The boxes (8) would be slid on to a board and placed in the furnace, without further handling. The bags might be made of tarred-calico (capacity 1 c. ft.); the boxes of compressed tarred felting or papier-mâché.

chemical could be added in small quantity also, if it were thought advisable, to kill off possible pathogenic germs. The stone pit or filter system could be used to dispose of the then sterilised urine in bulk, which soon finds its way into the soil, and which as a fluid is easier to deal with than excreta. Any system of attempting to sterilise large volumes of urine by

heat seems not only impracticable, but is very expensive and seriously complicates the bigger question of incinerating the excreta. The McCall incinerators, however, do deal with this question, by evaporation. I propose to discuss this side of the question in a further note.

### A CASE OF PARATYPHOID FEVER FOLLOWED BY INFECTION OF THE KIDNEY BY A PARACOLON BACILLUS.

BY CAPTAIN D. HARVEY, V.H.S.

*Royal Army Medical Corps.*

PRIVATE B., Highland Light Infantry, was admitted to hospital in Darjeeling on September 21st, 1908, suffering from fever. He had arrived in the station from Dum Dum on August 18th, 1908; there were at the time no cases of enteric fever in hospital either at Dum Dum or at Darjeeling.

On admission he stated that he had been unwell for at least ten days previously, that he had been unable to take his food, and had suffered from headache. One of the principal symptoms during the fever was a severe sore throat.

Four days after admission diarrhœa developed, and the patient became collapsed, but there was no hæmorrhage from the bowel. He rallied well from this under appropriate treatment, and thereafter his temperature was of a high remittent type, intermitting on two occasions, and finally dropping to normal on the thirty-fourth day of disease, and twenty days after admission to hospital. It is noted that for some time during convalescence his pulse-rate was rapid.

He arrived at the Convalescent Dépôt, Naini Tal, on December 12th, 1908, looking very fit, and stated that he felt perfectly well. On examination of his urine by the direct plating method he was found to be passing in large numbers a bacillus resembling the *Bacillus paratyphosus* B, in the appearance of the colonies. These colonies, when closely packed, were small, blue, and transparent, but where they had room to grow out showed a definite greyish-purple centre.

The urine was turbid, and contained a small quantity of albumen; on centrifuging a few pus-cells and blood-cells were seen, and an occasional tube-cast (blood). A count of the urine showed that there were 40,000,000 bacilli per cc. On January 12th, 1909, this man's serum gave the following agglutination reactions:—

				Dilutions of serum.			
				1—20	1—40	1—100	
Typhoid bacillus	..	..	..	Trace	..	—	..
Para. A	..	..	..	+	..	+	..
Urine bacillus	..	..	..	±	..	±	..
Para. B	..	..	..	—	..	—	..

The bacillus from the urine gave the following reactions:—

A short, thick bacillus, only feebly motile, non-Gram staining.

	24 hours	48 hours	5 days
Lactose .. ..	Faint acid, no gas	Acid, some gas	..
Glucose .. ..	A G	..	..
Maltose .. ..	A G	..	..
Mannite .. ..	A G	..	..
Saccharose ..	A G	..	..
Litmus milk ..	Acid, no clot	Acid, no clot	Acid, no clot
Peptone water .. ..	.. ..	..	Trace of indol

Neutral red agar shake : Gas and fluorescence.

Gelatine : Bluish-grey moist growth. No liquefaction.

Conradi plates : Small colonies, blue and transparent ; large colonies, purple-grey centre.

Neutral red agar plates : Clear, transparent colonies, no redness even after 5 days growth ; coli colonies on the same medium showed a bright red centre in 24 hours.

The subcutaneous injection of 3 cc. of a forty-eight hours' broth culture had no effect whatever on a young guinea-pig.

This bacillus, then, differed from the paratyphoids in that it gave a trace of gas in lactose in forty-eight hours and also fermented cane sugar. It differed markedly from *B. coli communis* in the appearance of the colonies on Conradi and neutral red agar plates, also in its slow and feeble fermentation of lactose and non-clotting of milk.

The bacillus was not agglutinated either by typhoid or paratyphoid high titre serum.

The patient improved much in general health, and stated that he had no frequency of micturition, pain, or other symptoms of cystitis, but as he continued to pass the bacilli in large numbers he was placed on urotropine, 10 grains, three times a day for a fortnight, and then for three days was given 20 grains three times a day ; the drug, either during its administration or later, had no effect whatever on the excretion of the bacillus.

In March, 1909, a vaccine was prepared from his bacillus, the growth on an agar tube being scraped off into 8 cc. of sterile normal salt solution, and sterilised by heating to 55° C. for one hour.

A dose of 1,000 million was given subcutaneously on March 16th, 1909. Immediately after the administration of this dose the patient was observed giving an exhibition on the parallel bars, which may account in part for the somewhat severe reaction which followed.

He reported sick next morning, and stated that he had had slight pain at the site of inoculation, but that he had been much troubled by frequency of micturition during the night, and had vomited after his breakfast ; he also complained of pain in the back, but had no fever. On examination of the urine it was obviously tinged with blood, the amount of albumen was considerably increased, also the number of pus and blood cells and tube casts, and the bacilli were present in greater numbers than ever.

During the first twelve hours in hospital he required to pass urine every hour or so ; he was put into bed and given a milk diet, and in a few days had regained his former state of health, although the urine appeared more turbid than before the inoculation.

His agglutination reactions on March 27th, 1909, were as follows :—

				Dilution of serum.		
				1—20	1—40	1—100
Typhoid bacillus	..	..	..	Trace	..	—
Para. A	..	..	..	+	..	±
Own bacillus	..	..	..	+	..	±
				Pte. F. serum.		
				1—20	1—40	1—100
Typhoid bacillus	..	..	..	Trace	..	—
Para. A	..	..	..	+	..	±

Private F. was a convalescent from enteric fever, from whose blood the *B. paratyphosus* A, had been isolated during the illness in October, 1908.

				Pte. C. serum.		
				1—20	1—40	1—100
Typhoid bacillus	..	..	..	+	..	±
Para. A	..	..	..	—	..	—
Urine bacillus	..	..	..	±	..	±

Private C. was a convalescent from enteric fever. It will be noticed that his serum agglutinated the urine bacillus in higher dilutions than did that of Private B. previous to inoculation.

On March 30th, 1909, a second dose of vaccine was given ; no reaction beyond a slight local one followed this inoculation, and it had no effect on the excretion of the bacillus.

In July, 1909, Private B. was discharged from the Dépôt quite well "in himself," but still passing the bacillus in his urine in large numbers.

From December, 1908, until July, 1909, the bacillus was invariably present in the urine from day to day, and always in pure culture ; it was tested frequently, and gave the same reactions in the sugars and in milk.

It is noted in his case sheet that during convalescence the patient was exceedingly constipated, and the probability is that during this period the kidney became infected from the intestine either by the lymph channels or the blood capillaries.<sup>1</sup>

I have to thank Lieutenant-Colonel W. W. Pike, D.S.O., R.A.M.C., for kindly allowing me to use the notes from the case sheet and temperature chart of this case.

<sup>1</sup> Wilson, W. J., *Journal of Hygiene*, vol. viii., No. 4, September, 1908.



## THE CAUSE AND TREATMENT OF BOILS.

BY CAPTAIN N. J. C. RUTHERFORD.

*Royal Army Medical Corps.*

As medical officer in charge of troops at a cavalry station I find that much of one's work is taken up with the treatment of men suffering from "boils." A recruit of a few weeks to a few months service reports sick with a crop of boils on the buttocks, thighs, and back; under treatment he improves slowly, and finally returns to duty to resume his riding school course, but much time has been lost and he goes back to start his riding as "soft" as when he joined, and in many cases he breaks down again with the same complaint.

Looking up the returns for 1908, I find that amongst sick from all causes "boils" showed a percentage of 25, and of these cases 32 per cent. were re-admitted for the same disease. I am of opinion that insufficient hot bathing has a great deal to say to this state of things. That point has been fully gone into and what can be done in that way is being done; still, in six months of recommendation and treatment the condition of things is not so much improved as one would wish. Treatment of these cases consists in disinfection of the surrounding skin, cleaning out the boil with dry sal-alembroth gauze wrapped tightly round the points of a narrow-bladed dressing forceps, or, if the boil is very small, I clear out the point of pus with a pointed wooden match dipped in pure carbolic; then boric fomentations are applied; attention is paid to the daily disinfection of the skin to prevent multiple infection, which will frequently be set up if boric fomentations are used alone. As a rule this suffices for ordinary cases; they go away cured, and one does not see them again; but there is a class of case that seems to have its resistance to staphylococcus infection lowered and the smallest encouragement will start crops of boils again. In these cases I have used a polyvalent staphylococcus vaccine, kindly sent to me by Major Harrison, with encouraging results, as shown in the following table. I have used the vaccine in combination with local treatment; in hospital cases I see that the patient has a daily hot bath, and in those treated as out-patients I advise the men that a daily hot bath is part of the treatment. The vaccine contains 500 million microbes per cc. One man refused to continue the treatment as he found the first injection painful; none of the others made any complaints, and beyond a slight stiffness at the site of the injection, lasting from twelve to twenty-four hours, they felt perfectly well. The injections are given once a week. No opsonic index investigation has been possible. I should be glad to hear the views, as to causation and treatment, of other officers in medical charge of mounted troops, &c., as I understand this is a common complaint where mounted troops are stationed.

Name	Unit	Admission	Discharge	Re-admitted before vaccine treatment	Number of injections	Re-admitted after vaccine treatment	Treatment as in or out patients	Remarks
Private S.	.. 21st Lancers	19.10.08	1.11.08	Yes	Two	No	Out	—
" B.	"	23.11.08	29.1.08	No	One	"	"	Refused further treatment; suffered from boils in civil life.
" C.	"	6.1.09	20.1.09	Yes	Two	"	"	—
" T.	"	13.4.09	1.5.09	"	"	"	"	—
Corporal B.	"	14.4.09	2.5.09	"	"	"	"	—
Private B. <sup>1</sup>	"	"	"	"	Six	Yes	In	—
Corporal D.	"	18.11.08	26.11.08	"	Two	No	Out	—
Private H.	"	20.3.09	10.4.09	"	"	"	"	—
Gunner S.	R. H. A.	12.3.09	1.5.09	No	Three	"	In	—
Dr. H.	"	26.1.09	17.2.09	"	Two	"	"	—

<sup>1</sup> Four admissions to hospital, treated as out-patient four times, received two injections at third admission, re-admitted again and received four injections.



## FLY-BORNE ENTERIC FEVER: THE SOURCE OF INFECTION.

By MAJOR N. FAICHNIE.  
*Royal Army Medical Corps.*

IN an article in the Journal (Notes on Enteric Fever Prevention in India, by Lieut.-Colonel Caton Jones, R.A.M.C., vol. viii., 1907), it was pointed out that since a raid on flies had been commenced in Nasirabad, in 1904, the enteric fever rate there had very much diminished, and that the results obtained were partly due to a better system of trenching the night soil, by which the breeding of flies was prevented.

One of my first duties as sanitary officer of the division in which Nasirabad is situated was to report on its water supply. As a result of my inspection and analysis I was satisfied that the water was above suspicion, and had probably been so for many years. Meanwhile the improvement in the enteric rate, which commenced in 1904, has been maintained up to August 1909.

At my first visit to Nasirabad, in January of this year, flies were present both in the barracks and in the hospital, but only a few were then found at the trenching ground; at my second visit, at the end of May, none at all were found in that place. In my headquarter station, Mhow, there was also a sudden diminution in enteric fever in 1907, which has been maintained ever since. This diminution coincides with the inspection of the station by Surgeon-General Trevor, who found the trenching grounds swarming with flies. Since then, owing to the skill and watchfulness of the Cantonment Magistrate, Major Hunt, a marked change in this respect has followed, and now for eighteen months scarcely a fly has been bred there.

This drop in the enteric fever rate is very marked, but it cannot be put down solely to anti-typhoid inoculation, for although the majority of the people in the station have been inoculated, many have not, and of those who have been many were done in 1907, and are now showing only slight signs of protection, judging by their agglutinins. There are also in the station over sixty men who had enteric fever before the days when convalescents were examined to eliminate "carriers." An examination of these men has been quite recently begun, and already I have found two men who have been carriers since 1906, so that it cannot be said that anything more than usual has been done to prevent direct infection. The Mhow water supply is from a pure source, and does not require boiling, so there can be very little doubt that the essential cause of the improvement is the fact that flies do not breed in the trenching grounds.

At the beginning of this year the only station in the division that was suffering from enteric fever was Jubbulpore, which has an unquestionable water supply, but which is swarming with flies, even in the cold

weather. A visit to the trenching grounds always brings back numbers of them, conveyed by the horse and trap.

A consideration of the conditions of these three stations points clearly to the assumption that trenching grounds are very important factors in the causation of enteric fever, but this, of course, has been insisted on by many writers. I now come to the difficulty, and I hope to offer a solution, which is the object of this paper.

Most of the text-books lay stress on the certainty that flies transfer bacilli from latrines and trenching grounds to food by their legs, but they mention no other sources of infection. Munson quotes the instance of the feet of flies whitened in the latrines, and he also mentions that the enteric bacillus has been demonstrated in the excrement of flies fed on infected material. Odum, in a recent paper in this Journal, insists that the excrement is the source of infection, but he gives no information as to how this becomes infected itself. I venture to say that a consideration of the following observations and evidence points strongly to the conclusion that neither the feet of flies, nor their excreta when they feed on the contents of latrines, are common vehicles of fly-borne infection; but, on the other hand, the chief and most common method is by excrement when the flies are bred in an enteric infected material. By this I mean that one station may swarm with flies, bred only from the excreta of cows and horses, and yet have no enteric; while another place, where there are very few flies, but where these are bred from human excreta either in or out of the station, may have an epidemic, the source of infection being the excrement of the flies, and the insects themselves being carriers.

The following evidence may be given against the theory that infection is commonly carried by the feet of flies :—

(1) A freshly-hatched fly in the trenching ground looks very clean about the legs, and the chance of the survival of the delicate *B. typhosus* on these clean limbs after the fly has walked about the sun-scorched soil, seems very remote. As a fly takes ten days to hatch out, the surface of the soil itself will be free of enteric bacilli, which could not withstand the heat and sterilising power of the tropical sun for that period of time. When going back to barracks the flies would avoid the Crowley cart itself on account of its odour of pesterine or other material used to wash it before its return. When the flies do reach barracks they avoid the latrines, because since 1905 these have smelt of carbolic or cresol. If the soil is very wet it has been observed that the flies do not hatch out at all.

(2) For the three years 1904-1907, no case of enteric fever was contracted in any camps of regulars, militia, yeomanry, or volunteers, throughout the Northern Command at home, except one small outbreak in 1907, limited to the men in one tent, and which was certainly not from fly infection. In these camps the latrines were either simple trenches,

the excreta in which were covered with earth three or four times a day, and left exposed in between, or a system lately adopted, viz., the dry earth and bucket system, which has been universally condemned in India. Flies at home are not, of course, so prevalent as they are in India, still they are by no means absent, especially in mounted corps.

Now, if Mhow and Nasirabad may be taken as places where enteric fever in former years was due to flies, we were having an enteric rate, due to this cause, of 34 and 49 per 1,000, when the figures were taken for ten years, and in single years as high as 49 and 121 per 1,000 respectively. If flies can convey the infection to this extent by bacilli on their legs or in their excrement, when they have fed on infected material in Mhow and Nasirabad, then the absence of the disease in the camps at home requires some explanation that has not yet been given.

(3) The barracks at Preston, Leicester, and Warrington, all have, or had, latrines on the bucket system, while at Warrington earth was not allowed at all. The records show no excess of enteric fever in these stations.

(4) Hull is a town with about 45,000 privies. According to model bye-laws a privy must be well ventilated, which of course allows flies free access; it should be at least 6 feet away from a dwelling, and the excreta should be frequently covered with ashes; in Hull the privies are cleaned once a week. It is difficult to imagine anything more conducive to fly infection, if the poison is conveyed by the feet, or if flies from feeding can infect by their excrement, yet the average enteric rate of Hull is well under 0.75 per 1,000. York, on the other hand, with only 6,000 privy-middens, has a much higher enteric rate than the last-named town; in 1893, when there was an epidemic, it was nearly 3 per 1,000, and was ascribed by the Medical Officer of Health to the privy-middens. This makes an explanation of the theory I am advancing very simple, because in Hull, where the privies are cleaned once a week, there is not time for flies to be hatched out, but there is ample time for this to occur in York, where they are only cleaned once a month.

The following observations may be put forward to support the theory that the enteric bacillus is conveyed by the excrement of flies bred in infected material:—

(1) A fly, I have found, can live eleven days, but according to others, fourteen to twenty-one days is usual.

(2) When a fly is put in a clean paper box, it appears that excrement is passed fifty times in twenty-four hours. On examining a bottle that had contained thirty flies for three hours, I found it simply covered with dots of excrement.

(3) Each droplet of fluid from a fly's intestine contains thousands of bacteria, including the ordinary colon bacillus, but the track of a fly's legs in a Petrie dish shows comparatively few—and scattered—bacilli.

(4) Larvæ about twenty-four hours old that have been bred in human

fæces, are seen to be yellowish bodies whose intestines are full of a dark substance, obviously the fæces from which they are bred. Plates prepared from the larvæ have the same appearance as those put up from the fæces the larvæ were bred in.

Owing to lack of material, I have been unable to breed flies from the excreta of typhoid and paratyphoid patients, in order that I might separate the specific bacillus in the various stages of each fly's existence. I was recently sent to investigate a small outbreak of enteric fever at Kamptee, where, after excluding all other causes, I was obliged to suspect flies. These insects were by no means numerous in the station; in fact, there were not nearly so many as in Mhow, but there were a few present in the verandahs of kitchens and barracks. About forty flies were collected, twenty each from the verandahs of the artillery and infantry kitchens, and brought back to Mhow for examination. Twelve flies from the artillery lines were mashed up in sterile normal salt solution, and a drop plated, with the result that *Bacillus typhosus* was separated. This bacillus was agglutinated by a dilution of 1 in 10,000 of a specific *B. typhosus* serum; it was very motile, Gram-negative, did not clot milk, and it gave the usual reactions with the following sugars in my laboratory: lactose, glucose, inulin, dulcitol, and mannitol.

Also twelve flies from the infantry kitchen were treated as follows:—

Each was transfixed with a sterile needle, and passed two or three times through a flame, until the legs and wings were scorched; they were then put into normal salt solution and stirred without breaking with a glass rod. One cc. of this solution was seeded into McConkey broth, which remained unchanged, thereby showing the absence of *B. typhosus* on the legs and wings after burning. After this the flies were mashed up, and a drop of the fluid plated. *B. typhosus*, as above, was found again, thereby demonstrating that the bacillus was present in the intestines, but not on the legs.

The lines of the Manchester Regiment, where these flies were caught, were in exceedingly good order, so that it is fairly certain that they were infected and bred outside barracks; in fact, I found the probable source of infection and breeding ground, with many flies present, but unfortunately none were collected for examination.

*To sum up.*—Experience seems to show that infection conveyed by flies' legs, natural though it may appear from all the experiments carried out to prove its possibility, is not a common, nor even a considerable cause of enteric fever, in time of peace, at any rate. On the other hand, infection by the excrement of flies bred in infected material explains many conclusions formerly difficult to accept. In a word, it is the breeding ground that constitutes the danger, not the ground where the flies feed.

If this be confirmed by further experiment and observation, the indications for sanitary measures will be narrowed down and become quite

definite, especially if we bear in mind those two important observations, viz., the breeding of 4,000 flies from  $\frac{1}{6}$  of a cubic foot of trenching ground, and the breeding of 500 flies from one evacuation of the human bowel. In privy-midden towns at home, whose enteric rates are, as a rule, higher than those of water-closet towns, the mere cleaning of the privies once a week, or even once a fortnight, during the autumn or summer, instead of once a month, should have a marked effect, and the difference between York and Hull may probably be accounted for in this way.

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REPORT ON A CASE OF PETROL POISONING BY  
INHALATION.

By MAJOR B. W. LONGHURST.  
*Royal Army Medical Corps.*

THE following notes of a case of petrol poisoning by inhalation may be of interest.

About 6 a.m. on April 20th, 1909, Mrs. X. was washing her head with petrol, which had been recommended by one of her relations as "a good thing" for the hair; she poured the petrol into a wash-hand basin, and then bending over bathed her hair in it. While this performance was taking place she became giddy, staggered about the room, and fell on her bed apparently unconscious. Her husband, Major X., immediately came over for me and explained what had occurred.

When I arrived at the house and entered the bedroom the odour of petrol was overpowering, Mrs. X. was lying on her bed in an almost unconscious condition, the pupils were widely dilated, the skin was cold and clammy, and breathing stertorous, and the pulse small and imperceptible; but the most striking thing to note was her appearance. Her face was dusky in colour and swollen to a remarkable degree, especially around the eyes and in the parotid region.

I immediately removed her to another room, and placed her in front of open windows in a current of fresh air. Signs of improvement showed themselves immediately; she gradually regained consciousness, violent clonic spasms with shouting and screaming occurred, symptoms practically identical with those so often seen during the recovery from anæsthesia by nitrous oxide gas and ether. Soon after this the patient passed into a condition of collapse and shivered violently; she was placed on a couch, covered with blankets, and a little whisky and milk were administered; she remained quiet for about two hours, her temperature was subnormal, but the pulse-rate was over 160 (varying from 160 to 200), violent tachycardia being present. As the patient recovered consciousness, it was found that she was almost unable to move her arms and legs, more particularly on the left side. A mixture containing digitalis was prescribed and the palpitation had much improved towards evening, the patient being able to take a little fluid nourishment.

On the second day the palpitation was still present, the pulse-rate being over 100, but the patient did not complain of the thumping of the heart which was so distressing on the first day; the movements of the limbs were still very feeble, and she complained of stiffness of the fingers, also contracture of the left arm, with a peculiar tingling sensation amounting to actual pain. She was now able to take solid food and to go out for a drive in the evening.

On the third day she had practically recovered, but still complained of the peculiar symptoms in the left arm, which remained for several days and then gradually disappeared under the influence of digitalis.

I have heard of cases of this kind proving fatal, and I am firmly convinced that this case would have proved so if the patient had not been removed to another room in time.

I should like to ask whether there is any antidote in a case like this which can be given by injection hypodermically.

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#### A CASE OF MALARIAL FEVER CONTRACTED AT ALDERSHOT.

BY CAPTAIN P. G. EASTON.  
*Royal Army Medical Corps.*

PRIVATE M., aged 27, with three months' service in the 2nd Battalion Lincolnshire Regiment, reported sick at the Cambridge Hospital, Aldershot, on the evening of July 4th, 1909, with a temperature of 105° F. He gave a history of having had attacks of fever and shivering every alternate day for the past week, previous to which he had always enjoyed good health. He was born in London and had never been out of England in his life. He had been employed at the London Docks ten years before but did not contract any illness there. For several years before enlisting he had worked as a painter and decorator in London.

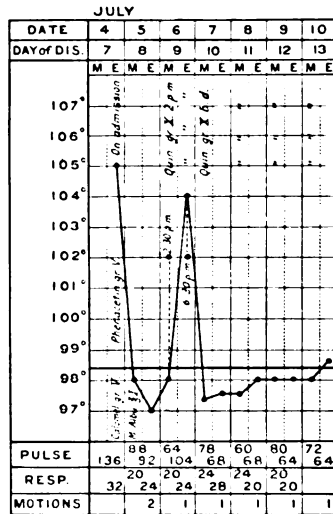
Captain Churton, R.A.M.C., who, as orderly medical officer, first saw the patient, was impressed with his clinical resemblance to a case of malaria, and took a blood-film, in which he found numerous rosettes. He was put to bed and given a small dose of phenacetin, which produced a profuse diaphoresis, after which he slept well.

The next day the patient's temperature was normal. On examination no enlargement of either spleen or liver could be detected; there was some anæmia. Blood-films were taken and numerous benign tertian parasites were found in them. The urine showed a faint trace of albumin. No quinine was given.

The next day (July 6) the temperature was again normal in the morning and at 2 p.m. Ten grains of quinine sulphate in an acid mixture were given by the mouth. At 2.30 p.m. the temperature rose to 102° F, and

had reached  $104^{\circ}$  at 6 p.m. Phenacetin and a diaphoretic were ordered and the temperature fell rapidly.

In the morning (July 7th) the temperature was normal and the patient was feeling comfortable. From this date he took 10 grains of quinine by the mouth, night and morning, and till his discharge from hospital on July 20th there was no return of the fever. He reported himself on August 8th, when he was in excellent health and had had no recurrence of the fever.



This case is interesting, as the patient had never been abroad and had presumably been infected in Aldershot. On being questioned he stated that he remembered being bitten by some gnat on the wrist about a fortnight before admission, at night, and when near the Basingstoke Canal. In the case reported in the Journal for August, 1906, Majors Copeland and Smith were doubtful as to the channel through which infection had taken place, but in the present instance I consider that there is every reason to believe that the patient was infected in the usual way by a mosquito, as undoubted specimens of the *Anopheles* mosquito have been observed in Aldershot, and, at the same time, there are a considerable number of malarial subjects in the command.

## Echoes from the Past.

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### REPORT OF A SPECIAL MEDICAL BOARD ON THE PREVALENCE OF PURULENT OPHTHALMIA IN THE ARMY.

Extract from General Orders, Circular Letters, &c., dated from  
January 1st, 1807, to December 31, 1812. Pp. 409-416.

#### GENERAL ORDERS.

*Horse Guards,*

*April 10th, 1810.*

It is the Commander-in-Chief's command that the accompanying "Report of a special Medical Board, which has been assembled to take into consideration the prevalence of the purulent ophthalmia in the Army," shall be circulated for the information of the commanding officers of regiments, and for the guidance of all medical officers belonging to the Army.

By Command of  
The Right Honourable  
The Commander-in-Chief,  
HARRY CALVERT, A.G.

Report of a *Special Medical Board*, assembled by desire of the Commander-in-Chief, to take into consideration the prevalence of the purulent ophthalmia in the Army.

Sir Lucas Pepys, Bart., President.

Sir Henry Halford, Bart.

Dr. Baillie.

Dr. Blane.

Dr. Moseley.

Everard Home, Esq.

Thomas Keate, Esq.

Francis Knight, Esq.

Henry Cline, Esq.

James Ware, Esq.

J. W. Phipps, Esq.

The Board, having deliberately investigated the circumstances connected in a general manner with the disease, and having adverted more particularly to those points which appear to have occasioned its late prevalence in the Army, begs leave to submit to the Commander-in-Chief the following remarks upon it; and, for the sake of perspicuity, it is thought advisable to arrange their



observations under two general heads: The means of prevention and the methods of cure.

Under the first head, that of prevention, the Board is of opinion:—

First.—As the purulent ophthalmia appears to be communicable principally by means of morbid matter applied to the eyes, one of the most obvious modes by which it may be prevented from spreading is the immediate separation of those who have caught the disorder from the rest of their comrades and associates. As soon, therefore, as the disorder is discovered to exist in a regiment, the Board is of opinion that the surgeon, or his assistant, should daily inspect the eyes of all the soldiers, and if there be the smallest appearance of inflammation in any of them, these should be immediately removed from the rest and be sent to the hospital or *dépôt*; in order, not merely that the disease may be prevented from being communicated to others, but that proper remedies may be employed in the most expeditious manner, to arrest its progress in the persons who suffer under it.

Secondly.—Cleanliness, as a means of prevention, is of such high importance that it cannot be urged too forcibly. In this part of the report the Board is of opinion that it cannot object in too strong terms to a practice which has been very commonly pursued in the Army, and in many other confined situations—that of permitting a number of persons to wash their faces in succession, not only in the same tub or basin, but with the same water. This practice should be peremptorily prohibited in all His Majesty's regiments, particularly in those where the purulent ophthalmia has prevailed; and, instead of it, the men should be obliged to wash their faces in a running stream, either from a pump or a closed cistern, under which there is not any receptacle for the waste water; and instead of wiping the face with a towel common to many, each man should be supplied with one for his own use; and he should be strictly prohibited from lending or borrowing any article of this kind. For greater security in this respect the Board recommends that those men who suffer under the ophthalmia may be provided with a towel having a distinguished mark, such as a coloured border. These marked towels should be kept separate from the rest, and should not be washed by the common washerwoman, but by a person appointed for this special purpose.

Thirdly.—The bedding and clothes of those who have the purulent ophthalmia are liable to be so much imbued with the discharge that issues from the eyes as to become a possible cause of com-

municating the disorder to others. The Board recommends that these be frequently washed and scoured; and as the bolsters and sheets are particularly liable to be thus imbued, the bolsters should be covered with linen cases, and these, as well as the sheets, be frequently and thoroughly washed and cleansed. If this work be properly performed it does not appear to the Board that these articles need be destroyed. This remark may be applied also to the towels, and to most other things of a similar kind, that are employed by the nurses and patients. Sponges, from their porous texture, furnish an exception to the above rule; these it may be better to destroy than to return to store.

Fourthly.—The Board does not presume to offer any opinion on the choice of depôts for persons who suffer under this disorder, though the subject has been brought before it by a member of the Army Medical Board. This Board has not sufficient local information to guide its judgment on the subject, and, as it seems intimately connected with general military arrangements, the Board leaves it to the consideration of more competent military authorities.

Under the second head, which relates to the methods of cure, the Board observes that it is impossible to offer directions that can be applied to all cases of this disorder. The purulent ophthalmia prevails at different times, and in different places, with very different degrees of malignity; and even in the same place, and at the same time, some persons suffer under the most violent symptoms of the disorder whilst others have it in a comparatively mild form. This variety does not depend on any known difference in the constitution of the patients; some who are weakened by previous indisposition having had both the inflammation and the purulent more severely than others who, previous to the attack of this disorder, were in high health and strength. Without directing the practice, therefore, in each individual case, the Board presents the following observations on a few of the principal remedies that are likely to be required:—

First.—On the necessity of taking away blood. When this disorder attacks persons who are strong and plethoric, there cannot be any doubt relative to the propriety of taking away a large quantity of blood; and this in general will be done most speedily, and most effectually, by making a large orifice in a vein in one or both of the arms. When the disorder attacks those who are weakly and debilitated by former illness, if the inflammation be accompanied with a great tumefaction of the conjunctiva and a profuse purulent discharge, together with much pain both in the head and eyes, the

necessity of taking away blood appears also to be so strong that the Board does not think it can be postponed without imminent danger to the patient's sight; but the quantity to be taken away need not be so great in this as in the former instance; and perhaps the bleeding may be performed most advantageously either by opening the temporal artery, by cupping on the temples or nape of the neck, or by applying six or more leeches on the temples or forehead. Sometimes after taking away blood from the arm, it becomes necessary to repeat the operation more than once, and occasionally, to apply leeches many times in succession. In some instances it has also been thought useful to scarify that part of the conjunctiva that lines the inside of the eyelids; but this operation should be performed with a very sharp lancet; and it seems more advisable in the subsequent stages of the disorder, than at the time the inflammation is in the height of its violence.

Secondly.—When the purulent ophthalmia pursues its course in the most malignant manner it usually terminates in a rupture of the cornea; and this accident too often involves the pupil and much injures, if it does not destroy, vision. The Board is therefore of opinion that as soon as the symptoms justify an apprehension of this event, a puncture should be made on the side of the cornea in order to discharge the aqueous humour. This puncture may be made by a careful person without any danger either with a spear-pointed lancet, with the knife used to puncture the cornea in the operation of extracting the cataract, or with an instrument which resembles a common couching needle but is somewhat larger, and has a groove passing through it longitudinally, through which the aqueous humour escapes as soon as the point of the instrument has penetrated into the interior chamber. Whichsoever of these instruments be employed, it should be introduced parallel to the plane of the iris, that it may not wound this membrane; and it should be withdrawn as soon as the aqueous humour has been discharged. Sometimes in the purulent ophthalmia matter is rapidly formed in the aqueous humour behind the cornea, and in such a case the operation of discharging it becomes indispensable; but for this purpose the knife used to divide the cornea in extracting the cataract is more proper than either of the other two that have been mentioned.

Thirdly.—Blisters may be applied with advantage in almost every stage of the disorder; but the Board is of opinion that during the violent state of the inflammation they will be more beneficial between the shoulders than nearer to the eyes. Issues made behind

the ears by means of caustic may also be useful in the subsequent stages of the disorder.

Fourthly.—During the time that thick, purulent matter issues profusely from the surface of the inflamed and tumefied conjunctiva, it should be washed away once at least in every hour. This will be most effectually performed by injecting a medicated liquor between the eye and the eyelids by means of a blunt-pointed syringe. The liquor should be propelled with sufficient force to bring away the matter, but without suffering the end of the instrument to touch the eye, and without making any pressure on the globe itself, either with the syringe or the finger. A solution of the sulphas cupri (such as the mixture of 1 part of the lotion commonly denominated Bates's camphorated vitriolic lotion, and 6 or 8 parts of water), a solution of the cuprum ammoniatum (formerly called aqua sapphirina), and the liquor plumbi acetati dilutus, may be classed among the best applications in this state of this disorder. It is only necessary to give a caution against using these or any other applications in such a degree of strength as to pain the eye during the active state of the inflammation. In general it is believed it will be most useful to apply these lotions cold; but if the coldness be particularly ungrateful to the feelings of the patient (which is a rare occurrence, except in severely cold weather), they may be applied warm. Sometimes, and especially when there is considerable pain in the eye, advantage has been derived from holding the eye between the times of applying the lotion over the vapour of hot water, or from fomenting the eye by means of a sponge or fine flannel, either with a hot decoction of poppy heads or with a mixture of 1 part of vinegar and 10 or 12 of hot water.

Fifthly.—The Board is of opinion that the bowels should be kept in a laxative state during the violence of the inflammation, and saline purgatives appear to them preferable to those that are more stimulating.

Sixthly.—In the early stage of the purulent ophthalmia the use of alterative medicines seems wholly precluded. In its subsequent progress various kinds of alteratives, and also of tonics, may become useful according to the peculiar constitutions of the patients; but the selection of these must be left to the discretion of the medical men who prescribe them.

Seventhly.—A total abstinence from animal food and fermented liquors, and a very low diet in every respect, are absolutely required, so long as the violence of the inflammation continues. A more nutritious diet may be afterwards allowed; but the change should

be made with great caution, and the indulgence immediately prohibited if it appear to occasion any increase of the inflammation.

Eighthly.—It does not appear that injury has been derived from the access of cold air in cases of the purulent ophthalmia, when patients have not been exposed to partial currents of it. But manifest harm has been done by keeping them in hot rooms and confining them long in their beds.

Ninthly.—As instances have occurred of the ophthalmia having been produced by the application of acrid substances to the eyes, it may be proper to remark that neither the tumefaction of the tunica conjunctiva, nor the quantity of matter secreted by this membrane, are so considerable, when the disorder is produced in this way, as they are when it is occasioned by the contact of purulent matter.

By desire of the Board,

(Signed) L. PEPYS, *President*.

S. REED, *Secretary*.

London, February 5th, 1810.

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## Report.

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### FOURTH REPORT OF THE COMMITTEE ON PHYSIOLOGICAL EFFECTS OF FOOD, TRAINING, AND CLOTHING ON THE SOLDIER.

#### REPORT UPON CLOTHING AND EQUIPMENT.

UNDER ordinary conditions, when appearances are not considered, clothing is adjusted according to the work to be done and the nature of the weather; it is obvious, however, that the clothing of the soldier on active service must be a compromise between a very light uniform for work in hot weather and heavier clothing to resist the effects of inclement weather. This is the great practical difficulty, for in many countries the weather may suddenly change, and there may be a great difference between the temperature of day and night. There is, however, one method whereby an adjustment may be effected—the coat and shirt may be widely opened during hot weather and the performance of hard work. This could not be efficiently carried out with the old equipment, owing to the belt which was necessarily clasped round the waist and the bandolier, water-bottle, and haversack straps, which crossed the chest. The new equipment, known as the Mills-Burrowes pattern, is so adjusted that even in full marching order the belt can be unbuckled, and thus

constriction of the body can be avoided; the water-bottle and the haversack have no body-straps, and all the ammunition is carried in the belt and the side-straps, which are arranged as braces.

To compare the new with the old equipment, a series of experiments were made by Captain Parker, R.A.M.C., and Dr. Pembrey upon the physiological effects of marches upon soldiers, some of whom wore the new and some the old equipment. In order to discount the personal variations as far as possible, the men exchanged equipments on subsequent marches. Further, that personal experience might be obtained concerning the relative merits of the two forms of equipment, Dr. Pembrey joined in some of these marches under exactly similar conditions to those of the men. The experiments were conducted in a similar manner to those already published in the Committee's Report upon Marching. The march was for 7 miles, from the Cambridge Hospital, Aldershot, to Pond Tail Bridge and back; it was performed under the ordinary regulations for pace and halts. The comparison was made for both drill and full marching order.

It is difficult to obtain exactly similar conditions in such comparative experiments, for the variations in some of the most important factors—the temperature and moisture of the air, the amount of wind and sunshine—are beyond control. Further, it is necessary to remember that the weights of the two equipments are different; in both drill and marching order the new is heavier than the old equipment. This disadvantage, however, is only apparent, as will be seen from the figures. The weight of the new equipment exceeds the old by about 900 grammes (2 lb. nearly) in drill order, and by about 200 grammes ( $\frac{1}{2}$  lb. nearly) in full marching order, although in the new equipment fifty more rounds of ammunition are carried.

The following comparison of the weights of moisture lost by the body and gained by the clothing and equipment shows the advantage possessed by the new over the old pattern. When the jacket is fully unbuttoned, and the belt is unclasped, marching can be performed with ease, for the weight of the pack behind is balanced by that of the ammunition in front.

The first table shows that the evaporation of moisture from the clothes proceeded more rapidly owing to the exposure of the shirt by the opening of the jacket; in relation to the amount of moisture lost by the body, a much smaller quantity was retained in the clothes. With the old equipment a similar beneficial result could be obtained only by taking off the jacket. The observations upon this point are given in the second table.

There is an obvious advantage in drilling recruits in their shirt-sleeves during hot weather, but during active service in the field or on the line of march the jackets of the men could not be left behind, and, if carried, could not be rapidly put on. With the new equipment the opening of

COMPARATIVE TABLE SHOWING RESULTS OF MARCHING IN OLD AND NEW EQUIPMENT.

	Loss of moisture in grammes			Increase in weight of clothing in grammes			External temperature	
	Maximum	Minimum	Average	Maximum	Minimum	Average	Dry bulb	Wet bulb
2 Irish Fusiliers—								
Drill order, old pattern ..	1,000	730	865	50	10	30	Degs. F. 63	Degs. F. 55
Drill order, new pattern ..	1,200	880	1,040	50	20	35	71.5	60
Marching order, old pattern ..	1,000	880	940	180	170	175	67	59
Marching order, new pattern ..	1,270	1,020	1,145	110	10	60	69	58
M. S. P.—								
Drill order, old pattern ..	1,630	..	..	400	..	..	75	66
Drill order, new pattern ..	1,100	..	..	100	..	..	71.5	60
Marching order, old pattern ..	1,160	..	..	100	..	..	59	52
Marching order, new pattern ..	1,250	..	..	80	..	..	69	58
2 men of 1st Battalion Yorks and M. S. P.—								
Drill order, old pattern ..	1,850	1,200	1,600	480	122	354	69	54
2 Irish Fusiliers and M. S. P.—								
Drill order, new pattern ..	1,200	830	1,060	100	20	57	71.5	60
2 men of 1st Battalion Yorks and M. S. P.—								
Marching order, old pattern ..	1,550	1,160	1,400	520	100	320	59	52
2 Irish Fusiliers and M. S. P.—								
Marching order, new pattern ..	1,270	1,020	1,080	110	10	67	69	58

COMPARATIVE TABLE SHOWING RESULTS OF MARCHING IN OLD EQUIPMENT WITH AND WITHOUT JACKET.

	Loss of moisture in grammes			Increase in weight of clothing in grammes			External temperature	
	Maximum	Minimum	Average	Maximum	Minimum	Average	Dry bulb	Wet bulb
4 1st Battalion Yorks and M. S. P.—								
Drill order. No jacket .. ..	1,430	1,000	1,200	250	0	109	degs. F. 67	degs. F. 58
Drill order .. ..	2,000	1,200	1,600	480	90	254	69	59
Private T.—								
Drill order. No jacket .. ..	1,430	..	..	250	..	..	67	58
Drill order .. ..	2,000	..	..	480	..	..	69	59
Private B.—								
Drill order. No jacket .. ..	1,300	..	..	220	..	..	67	58
Drill order .. ..	1,850	..	..	460	..	..	69	59
Private D.—								
Drill order. No jacket .. ..	1,200	..	..	70	..	..	67	58
Drill order .. ..	1,740	..	..	120	..	..	69	59
Private C.—								
Drill order. No jacket .. ..	1,000	..	..	5	..	..	67	58
Drill order .. ..	1,200	..	..	90	..	..	69	59
M. S. P.—								
Drill order. No jacket .. ..	1,070	..	..	0	..	..	67	58
Drill order .. ..	1,420	..	..	122	..	..	69	59



the belt and jacket allows free evaporation of sweat to occur. This tends to efficiency, for the cooling of the skin is produced by a smaller loss of moisture from the body than would be the case if the evaporation were retarded by buttoning up the coat; there is greater comfort, the skin is kept drier, and the shirt is not wet with sweat.

During some of the experimental marches with the old equipment the shirts become wet through with sweat after a march of 7 miles on a hot day; the moisture could be literally wrung out from that part of the shirt which had been covered by the pad formed by the greatcoat. On another occasion a gain of 395 grammes (14 ounces) was found in the weight of the shirt; this was in the case of a private of the 3rd Battalion King's Royal Rifles, who had fallen out after marching 4 miles in full marching order on a day when the temperature of the air was 71° and 66° F. by the dry and wet bulbs respectively. He was sweating profusely, although he had taken about two hours to walk the 4 miles back to camp.

In connection with equipment, the other points of physiological interest which come within the terms of reference to the Committee are the comparative comfort of the old and new patterns, and the question whether the weight of the new equipment, with the full complement of ammunition, kit, and greatcoat, is excessive for recruits and trained soldiers. The Committee consider that the new equipment is more comfortable than the old, both in drill and full marching order. Their reasons for this conclusion are not only the personal expressions of the men, and of the member of the Committee, who have made similar marches in each equipment, but also observations made upon the general physiological effects of marching upon men wearing sometimes the one, sometimes the other equipment. It is unsafe to depend too much upon the opinions of men who have been wearing one equipment for years and then experiment with another; a verdict adverse to a new pattern may be due to the fact that they have adjusted themselves to the drawbacks of the old form and require time for accommodation to the new. In the present case this criticism can be largely discounted, for the general expression was favourable to the new equipment, and the one subject of the comparative experiments who had not become accustomed to any kind of uniform gave great preference to the new equipment.

In the old equipment it was necessary to keep the belt fastened, and in full marching order it had to be fastened tightly round the waist, otherwise it was dragged up against the chest by the weight of the greatcoat behind. It was exceedingly common to see men during route marches in full marching order with the old equipment jerk forward their bodies and throw up their shoulders in order to relieve the pressure of the belt on the lower portion of the chest.

The belt and straps of the old equipment do not allow the jacket to be fully opened; the disadvantage of this in connection with the evaporation of sweat has already been discussed; in addition they cause

a resistance to the respiratory movements of the chest and abdomen. The bandolier with its complement of ammunition weighs 4·13 lb., and this weight is largely borne by the chest, and has to be raised during each breath; unnecessary work is thus performed by the respiratory muscles. The constriction produced by belts round the body not only interferes with breathing during the performance of hard work, but also hinders the return of the blood to the heart.

The new equipment is free from all these defects, for the belt can be loosened or unclashed on the march, the weight in front balancing the weight behind. Further, the weight is borne by the shoulders, and not by the chest, abdomen, and back.

During a short halt it is impossible for the men in full marching order to throw off the old equipment and obtain full benefit from the rest, but by one motion this can be done in the case of the new, and it can be as quickly resumed. The Committee have considered this important point only from the physiological aspect; the obvious advantage from the military point of view they need not state.

When the belt and jacket are opened to allow free evaporation of sweat on a warm day, the braces or vertical straps of the new equipment are prevented by the shoulder straps from slipping, and in full marching order no trouble was experienced by flapping of the cartridge carriers; such a drawback might have been expected, but no man experienced it in practice.

With the full complement of ammunition, greatcoat, kit, &c., the weight of either old or new equipment is excessive for young recruits during route marches or manœuvres. The Committee have, in their report upon marching, pointed out the necessity of progressive training in marching with a load. On route marches it is not necessary, at first, for recruits to carry the sack, the greatcoat, and the necessary complement of ammunition.

With progressive training there is no reason to fear that the weight of the full equipment would injure men, especially if the precautions were taken to cool the body on hot days by opening the belt, jacket, and shirt, and to take off the equipment during any halt of definite duration.

There is one drawback in the new equipment which might be removed. The sack fits too closely to the soldier's back, and thus prevents the evaporation of sweat from this part of the body. In the experimental marches on hot days the back of the shirt under the sack was always damp or wet, even when the other parts of the shirt were fairly dry. This has already been recognised by the Establishments and Equipment Committee, and there is no doubt that it can be removed. It is only fair to point out that such a drawback was present in a minor degree in the old equipment, the greatcoat forming a pad over the back; further, the tight belt prevented the escape of moisture round the waist, as shown by the damp condition of the shirt in this region.

# APPENDIX.

## TABLES OF EXPERIMENTS.

### I. COMPARATIVE TABLE SHOWING RESULTS OF MARCHING IN OLD AND NEW EQUIPMENT.

Name	Dress	WEIGHT OF MEN. GRAMMES			WEIGHT OF CLOTHES AND EQUIPMENT. GRAMMES			RECTAL TEMPERATURE			SURFACE TEMPERATURE			PULSE		EXTERNAL TEMPERA- TURE		Wind
		Before	After	Difference	Before	After	Difference	Before	After	Difference	Before	After	Difference	Before	After	Dry bulb	Wet bulb	
C. ..	Drill order. Old.							Degs. F.	Degs. F.	Degs. F.	Degs. C.	Degs. C.	Degs. C.			Degs. F.	Degs. F.	
	April 20, 1908.	64,220	63,220	-1,000	11,550	11,600	+50	100.2	100.4	+0.2	..	..	..	94	116	63	55	
	Ditto															62	53	
	July 6, 1908.	63,900	62,650	-1,250	11,050	11,270	+220	99.9	100.4	+0.5	Wrist Cheek Breast	29.5 33.0 33.0	31.5 35.0 34.0	98	112	66	58.5 62	
New.	July 7, 1908.	62,850	61,650	-1,200	12,450	12,500	+50	100.6	100.8	+0.2	Wrist Cheek Breast	33.0 33.0 33.0	33.0 34.6 34.0	90	108	71.5 72	60 58	W. breeze.
	Marching order. Old.																	
	July 14, 1908.	62,700	61,700	-1,000	20,910	21,030	+180	100.2	100.6	+0.4	Wrist Cheek Breast	32.2 33.5 34.5	29.5 31.5 32.0	100	110	67	59 57	S.W. wind.
New.	July 9, 1908.	63,320	62,050	-1,270	20,940	21,050	+110	100.1	100.2	+0.1	Wrist Cheek Breast	33.0 35.0 34.6	32.0 33.5 33.5	96	110	69	58 60	N.W. breeze.
	Ditto															71		
	July 15, 1908.	62,150	61,000	-1,150	21,070	21,250	+180	100.2	101.1	+0.9	Wrist Cheek Breast	32.2 33.5 34.5	30.0 32.5 32.5	104	122	68	60 60	N.W. wind.

Ca ..	Drill order. <i>Old.</i> April 29, 1908.	58,250	57,520	-780	10,680	10,690	+10	99.6	100.9	+1.3	..	..	..	70	90	+20	63 62	55 53
	Ditto July 6, 1908.	56,370	55,450	-920	10,600	10,640	+40	99.7	100.6	+0.9	Wrist Cheek Breast	31.0 30.5 33.5	32.0 34.0 34.0	78	102	+24	66 74	58.5 62
	<i>New</i> July 7, 1908.	55,980	55,100	-880	12,230	12,250	+20	100.3	100.6	+0.3	Wrist Cheek Breast	32.0 32.2 33.5	32.5 32.5 33.0	82	108	+26	71.5 72	60 58
	Marching order. <i>Old.</i> July 14, 1908.	56,130	55,250	-880	21,000	21,170	+170	100.1	101.0	+0.9	Wrist Cheek Breast	32.0 32.5 34.5	28.0 28.5 32.0	78	104	+26	67 65	59 57
R. ..	<i>New.</i> July 9, 1908.	56,420	55,400	-1,020	20,800	20,900	+10	99.8	100.4	+0.6	Wrist Cheek Breast	32.5 33.2 34.5	31.0 33.5 31.5	78	98	+20	69 71	58 60
	Ditto July 15, 1908.	55,790	54,850	-940	21,170	21,320	+150	100.4	101.0	+0.6	Wrist Cheek Breast	32.5 33.0 34.0	29.5 32.5 33.0	94	116	+22	68 67	60 60
	Marching order <i>Old.</i> July 9, 1908.	60,140	58,900	-1,240	20,640	20,670	+30	100.5	100.6	+0.1	Wrist Cheek Breast	32.0 34.2 33.5	32.0 33.5 31.5	80	112	+32	69 71	58 60
	Ditto July 15, 1908.	60,620	59,600	-1,020	20,600	20,750	+150	99.8	100.6	+0.8	Wrist Cheek Breast	33.5 34.2 34.2	33.0 31.5 32.0	96	108	+12	68 67	60 60

COMPARATIVE TABLE SHOWING RESULTS OF MARCHING IN OLD AND NEW EQUIPMENT—Continued.

Name	Dress	WEIGHT OF MEN. GRAMMES			WEIGHT OF CLOTHES AND EQUIPMENT. GRAMMES			RECTAL TEMPERATURE			SURFACE TEMPERATURE				PULSE			EXTERNAL TEMPERATURE		Wind
		Before	After	Difference	Before	After	Difference	Before	Degs. F.	Degs. F.	Difference	Before	Degs. C.	Degs. C.	Difference	Before	After	Difference	Dry bulb	
R. (contd.)	Marching order. New. July 14, 1908.	60,750	59,870	-880	20,450	20,600	+150	99.8	100.2	+0.4	Wrist	33.0	31.5	-1.5	90	104	+14	67	59	S. W.
											Cheek	34.2	30.5	-3.7				65	67	wind.
											Breast	33.5	31.5	-2.0						
M. S. P.	Drill order. Old. Sept. 3, 1906. New. July 7, 1906.	62,800	61,170	-1,630	9,540	9,940	+400	99.8	102.3	+2.5	Wrist	31.0	35.2	+4.2	72	156	+84	75	66	S. E. to S. W.
											Cheek	..	37.5	..				79	67.5	
											Breast	31.5	34.2	+2.7						
	Marching order. Old. Sept. 10, 1908. New. July 9, 1908.	62,950	61,850	-1,100	10,400	10,500	+100	99.8	101.0	+1.7	Wrist	28.0	33.0	+5.0	78	116	+38	71.5	60	W. breeze.
											Cheek	32.5	34.0	+1.5				72	58	
											Breast	30.5	31.0	+0.5						
	Marching order. Old. Sept. 10, 1908. New. July 9, 1908.	62,740	61,580	-1,160	18,500	18,600	+100	99.8	100.8	+1.0	Wrist	24.2	32.2	+8.0	76	116	+40	59	52	N. E.
											Cheek	28.5	34.4	+5.9						
											Breast	31.2	32.5	+1.3						
	New. July 9, 1908.	63,100	61,850	-1,250	18,670	18,750	+80	99.6	101.1	+1.5	Wrist	28.0	34.5	+6.5	70	110	+40	69	58	N. W.
											Cheek	32.0	35.0	+3.0				71	60	breeze.
											Breast	31.0	33.5	+2.5						

## II. INFLUENCE OF MARCHING IN DIFFERENT CLOTHING UPON THE TEMPERATURE, PULSE, AND LOSS OF MOISTURE.

The following data show the influence of clothing, especially upon the evaporation of moisture from the body :—

Number of men	Number of observations	Number of days	Dress, old equipment	Increase in pulse			Increase in rectal temperature			Loss of moisture in grammes			Increase in weight of clothes in grammes			External temperature	
				Maximum	Minimum	Average	Maximum	Minimum	Average	Maximum	Minimum	Average	Maximum	Minimum	Average	Dry bulb	Wet bulb
				Degs F.	Degs F.	Degs F.	Degs F.	Degs F.	Degs F.	Degs F.	Degs F.	Degs F.	Degs F.	Degs F.	Degs F.	Degs F.	Degs F.
4—1st Battalion and M. S. P.	5	1	No jacket. Drill order	52	16	28	1.6	0.6	1.0	1,430	1,000	1,200	250	0	109	67	58
"	5	1	Drill order	48	24	41	1.8	0.8	1.5	2,000	1,200	1,600	480	90	254	69	59
Private T.	1	1	No jacket. Drill order	52	..	..	1.3	..	..	1,430	..	..	250	..	..	67	58
"	1	1	Drill order	46	..	..	1.8	..	..	2,000	..	..	480	..	..	69	59
Private B.	1	1	No jacket. Drill order	24	..	..	0.3	..	..	1,300	..	..	220	..	..	67	58
"	1	1	Drill order	48	..	..	1.2	..	..	1,850	..	..	460	..	..	69	59
Private D.	1	1	No jacket. Drill order	16	..	..	1.3	..	..	1,200	..	..	70	..	..	67	58
"	1	1	Drill order	24	..	..	1.8	..	..	1,740	..	..	120	..	..	69	59
Private C.	1	1	No jacket. Drill order	18	..	..	0.6	..	..	1,000	..	..	5	..	..	67	58
"	1	1	Drill order	38	..	..	0.8	..	..	1,200	..	..	90	..	..	69	59
M. S. P.	1	1	No jacket. Drill order	32	..	..	1.6	..	..	1,070	..	..	0	..	..	67	58
"	1	1	Drill order	48	..	..	1.7	..	..	1,420	..	..	122	..	..	69	59

The Committee beg to make the following remarks upon the service clothing of the soldier in relation to its physiological aspects: The shirt and boots are good; the jacket is good, but there appears to be a tendency to increase the height and tightness of the collar. This should be discouraged, for it hinders the evaporation of sweat and the free circulation of the blood. The trousers are good, but the Committee think that comparative observations upon the effect of the short trousers worn by scouts are needed. This might be considered in connection with the kilt, for there is no doubt that freedom of movement and of evaporation of sweat are facilitated by such loose attire.

One member of the Committee has tried the ordinary clothing of a private soldier during a considerable number of marches, and can speak most favourably of its comfort with the exception of the field service cap, which does not allow the free evaporation of sweat, and affords little protection from the heat and glare of the sun.

The Committee have also made observations upon both Regular soldiers and Volunteers during field days and manœuvres. The points to which they wish to draw attention are the need of practice in marching, especially for members of the Territorial Army, before a regiment goes into camp, and the importance of opening the coat and shirt during marching. Such practice is necessary, not only for the accommodation of the body to muscular work and fatigue, but also for the hardening of the feet; foot-soreness is a frequent cause of inefficiency and of falling out. Among the Volunteers foot-soreness was increased by a neglect to provide suitable socks or an extra pair; many of the men had only the pair they were wearing, and these were often in holes. Many Volunteers in civil life spend most of their time indoors and are not accustomed to marching in uniform and to exposure to the sun. A light slouch hat is much more suitable for these men than the present field service cap; a considerable number of them suffered much from sun-burn and blisters on the neck when they were wearing the field service cap.

#### CONCLUSIONS.

The Committee draw the following conclusions from their experiments and observations:—

The new equipment is superior to the old in the following respects: The weight of the sack behind is so well balanced by the weight of the ammunition in front that marching can be performed with the belt, jacket, and shirt widely open. There are no straps constricting the chest. The load is borne chiefly by the shoulders. The facility and quickness with which the new equipment, in full marching order, can be taken off and put on enable the soldier to obtain full benefit from any halt of a definite duration. The close application of the sack to the back of the soldier is a disadvantage which could be easily overcome.

The full equipment is comfortable, and the weight is not excessive for the man who has been progressively trained in marching with a load.

The clothing of the soldier is good and suitable for his work. The field service cap gives sufficient protection to the trained man who has become accustomed to exposure to the heat and glare of the sun, but for most members of the Territorial Army a light slouch hat would be more suitable.

The Committee wish to lay stress upon their former recommendation, "That it be an instruction to officers commanding that the order shall be given to men on the march in warm weather to open the jacket and shirt," for they have evidence that it is not sufficient to leave the initiative to the company commanders or to the men themselves.

In this, their last report, the Committee wish to express their warm appreciation of the services of their Secretary, Captain L. E. L. Parker, R.A.M.C. Apart from the ordinary duties of a Secretary, the work involved much research, both in the field and laboratory, and this Captain Parker carried through to the entire satisfaction of the Committee.

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## Reviews.

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IMMUNITY AND SPECIFIC THERAPY. By W. d'Este Emery, M.D. London: H. K. Lewis, 136, Gower Street, W.C. Pp. 448. Price 12s. 6d. net.

The aim of this book, according to the preface, is to give a fair and impartial account of the chief facts definitely known as to the methods by which the body protects itself from infections, and of their application in the diagnosis, prevention and treatment of disease. One may say at once that the author has succeeded in carrying out his intentions. The book contains as clear an account as is possible of the various substances concerned in immunity, with their probable nature and actions; and what we consider quite the most valuable feature of the work, gives in each case the experimental evidence on which a statement is founded. At the same time this very richness in detail serves to make the book by no means light reading, and one feels grateful to the author for the occasional interspersing of his narrative with philosophical considerations which are full of suggestions, and which serve in no little measure to reawaken the attention when it is flagging from the necessity for so close an attention to the intricacies of the argument. The introductory chapter is full of these suggestive points, and is sufficiently free from technical details to be of interest to the general reader. After that the main body of the book is devoted to the consideration of the various antigens and antibodies concerned in immunity, it is as clear as it is possible to make so highly technical a subject.

The work ends with a chapter on practical applications, which again



should be very useful to the general reader. There is a very full bibliography and a good index. A detailed account of a book containing such a mass of intricate problems is impossible; one can only say that the work contains about as good and impartial a description of the present state of our knowledge of immunity and allied problems as one can get in the English language.

W. S. H.

BLACKWATER FEVER (BILIOUS MALIGNANT TERTIAN AGUE). By A. G. Newell, M.D.Glasg., C.M., L.M., D.P.H.Cantab. London: John Bale, Sons and Danielsson, Ltd. 1909. Pp. viii. + 127. Price 5s. net.

The writer believes that blackwater fever is malignant tertian malaria with a superadded condition whereby the liver is unable to deal with the hæmoglobin, and that quinine causes blackwater fever by further depressing the already overtaxed liver.

"The fact, however, that the disease has occurred in cases where no quinine was taken proves that quinine itself is not the *causa causans*."

The author gives us the benefit of several years' experience in treating blackwater fever in the Duars, and the chapter on treatment is the most useful part of the book.

The author's views regarding the administration of quinine during an attack are in accordance with those of Bastianelli ("Manson, Tropical Diseases").

The pharmacology and chemico-physiological properties of quinine, in its relation to blackwater fever, are very fully dealt with in the appendix. It is not quite clear why a description of a case of kala-azar is included in a work on blackwater fever. The author does not trace any connection between the two diseases, although a photograph of this case forms the frontispiece to the book. The Leishman body was not found, but the diagnosis was based on clinical grounds. Blood was taken by splenic puncture, and some "pyriform bodies" were seen, one of which had a distinct filiform appendage. They were about the size of two or three red blood cells. It is a pity the author did not stain these bodies and have them photographed, instead of being satisfied with the crude sketch which is given in the text. It appears that these bodies were seen in a dried, unstained preparation; it would have been interesting to have noted if the filiform appendages showed any movement when examined in the fresh, wet film.

One third of the book is made up of appendices. The description of Gowers' hæmoglobinometer seems out of place in the appendix on stains: it should be included in the appendix on blood. The statement that "a measured pipette sucks up 20 cc. of blood" is evidently a printer's error.

The normal number of red blood cells is given as 5,000,000. It would be worth while mentioning that 1 cubic millimetre of blood contains this number of cells. The normal number of white cells is given as 7,500,000.

There are three mistakes in the formula of Toisson's solution. The description of Thoma-Zeiss's apparatus is inaccurate; the depth of the cell is given as 1 millimetre instead of  $\frac{1}{10}$  millimetre. Throughout this chapter the author speaks of millimetres of blood when he means cubic millimetres.

In the paragraph on the development of the malarial parasite we are told that "Spores taken into the intestine of *Anopheles* mature rapidly, &c., &c."

A list of twenty-eight fevers with their cause is given in Appendix E. Liver derangement is given as the cause of simple continued fever. When speaking of the prophylaxis of relapsing fever, inoculation of the sick is recommended; we presume isolation is intended.

Trypanosomiasis is included in the list of fevers in India, and hints are given how to avoid being bitten by *Glossina palpalis*. The incubation period of this disease is stated to be fourteen days. The remark that the author has "only seen one genuine case of acute Bright's disease in India" seems strangely out of place in the column of remarks dealing with the prophylaxis of acute rheumatic fever.

We gain the impression that the author has not had much experience in routine blood examinations, consequently we attach no importance to the discovery of bodies "of the nature of trypanosomes" in the splenic blood of the case referred to above.

H. W. G.

THE DIETETIC TREATMENT OF DIABETES. By B. D. Basu, Major, I.M.S. (retired). Published by the Panini Office, Buvaneshvari Ashram, Bahadunganj, Allahabad. Pp. 40. Price Rs. 1.8.

In this small book, the author at its beginning points out that "diabetes being a common disease among the educated community of India, it is necessary that they should be familiar with what to eat and drink in this disorder; and the following pages have been written as much for the general public as for the ordinary medical practitioner." The writings of Professor Carl van Noorden, S. Mohr and others, are referred to in this publication, and as their researches are described in technical terms it is difficult to understand how such a work will appeal to the general public (presumably the educated native public of India). The medical practitioner will derive many useful hints from this brochure. The author refers to the danger of the total withdrawal of carbohydrates from the diet of a diabetic, which, as Hirschfeld has demonstrated, may lead to acetonuria with a sequel of diabetic coma.

The author is of opinion that flesh food does great mischief in this disease, and he states that from his own observation diabetic patients who are vegetarians live longer than those who are meat eaters. He accounts for this result by stating that the kidneys are not so often disorganized among vegetarians as they are amongst meat eaters. He emphasises the additional importance of vegetable diet, in keeping the blood up to its normal alkaline standard and so warding off the development of diabetic skin affections, boils, carbuncle, &c. The skimmed milk treatment of Dr. Scott Donkin is alluded to, and the value of the administration of well-washed butter (in which process the lower fatty acids have been removed) is pointed out.

With regard to the administration of carbohydrates in the treatment of diabetes, the necessity of withholding them during the morning hours is stated; this being due to a larger excretion of sugar taking place then than at any other time of the day. The various carbohydrate cures (?) viz., "oatmeal," "potato," &c., are detailed. The dietaries of Dr. Pavy and Sir William Roberts, are given *in extenso*, but it is pointed out that

these contain many items unobtainable in India. The dietaries should, therefore, be revised to suit local conditions. The importance of the judicious use of alcohol in the disease is dwelt upon. It saves the oxidation of proteids at a time when they are badly needed, and lessens the possible output of acetone bodies.

The book is clearly written and well printed and is well worth perusal.  
F. M. M.

THE CAMPAIGN AGAINST MICROBES. By Étienne Burnet, M.D. Translated from the French by E. E. Austen, F.Z.S. Published by John Bale, Sons and Danielsson, Ltd., London. 1909. Pp. xi. + 248.

In this work the author addresses himself not to medical men only, but also to the educated public. By dealing only with selected subjects typical of certain lines of investigation, he seeks to indicate the nature of the questions at issue in the causation and treatment of disease.

The best chapters are those dealing with problems that have been solved and have passed beyond the stage of controversy. Those on "Tetanus" and "Variola and Vaccinia" are especially good; the gradual evolution of these problems from the obscurity of speculation to the light of knowledge enabling the reader to participate in the interest of the investigation.

The articles on tuberculosis and on cancer, though of very great interest, are naturally more open to criticism. In writing for the lay public, it is necessary to bear in mind the absence of a trained critical faculty in the reader; and a few assertions are made that are, in our opinion, open to argument. For instance, in comparing the protection conferred by attacks of certain acute diseases with the alleged absence of such protection in tubercle, the following passages occur:—

"A chronic disease is one in which there is no spontaneous vaccination."

"The sheep attacked by anthrax dies, or remains vaccinated. Man attacked by tuberculosis is left to his own resources, gets on with his enemy as best he can, he neither dies nor recovers."

We see reason to believe, not only that auto-inoculation (or vaccination) occurs in tuberculosis, but that it may bring about cure in favourable cases, and we deprecate the presentation of such pessimistic doctrine to the non-medical reader.

Under the heading of cancer the different hypotheses that have guided recent research are briefly explained. Some very convincing examples of "cancer houses" are given, and even of "cancer cages" in the case of mice.

This house-infection, if demonstrated, is a point of great interest. We may be pardoned for recalling that in the case of the three diseases typically associated with dwellings, namely, bubonic plague, African tick fever, and kala-azar, the causative organism gains entrance by the aid of certain unobtrusive inhabitants, insect or rodent, of the house!

There is an excellent chapter on enteritis and intestinal microbes, in which the scientific regulation of the intestinal flora is discussed; and as an appendix to the book Jenner's "Inquiry into the causes and effects of the variolæ vaccinæ" is given. The author's warm appreciation of the character and work of Jenner is often and generously expressed. We can heartily recommend the book as most interesting and suggestive.

S. L. C.

AIDS TO THE MATHEMATICS OF HYGIENE. By R. B. Ferguson. Published by Baillière, Tyndall and Cox, London. 1909. Pp. x. + 162. Cloth 2s. 6d. net.

The advent of the fourth edition of this book in a greatly improved form should be welcomed by all students and practitioners of hygiene. The collection into one work of the numerous and intricate calculations required in public health work, obviating the necessity of a search for any required formula through the pages of the standard works on the subject, combined with a lucid explanation of the method of using them, is of incalculable value, especially when time is limited.

The sphere of usefulness of the book is considerably increased in the new edition, which gives just the information wanted, with the necessary explanation, and without any superfluous matter. Despite the increase of information, it should be noted that the price, 2s. 6d., remains the same.

Altogether one has no hesitation in saying that this work should find a place among the possessions of everyone who makes a study of the science of hygiene.

C. F. W.

"ILLUSTRATIONS OF AFRICAN BLOOD-SUCKING FLIES, OTHER THAN MOSQUITOES AND TSETSE FLIES." By E. E. Austin, British Museum (Natural History Department). Longmans and Co., London. 1909. Price 27s. 6d.

The authorities of the British Museum, no less than the author, are to be congratulated on their enterprise in undertaking the publication of this excellent work. The part played by biting flies in the transmission of disease to man and animals in Africa is recognised as being of great and increasing importance and the identification of these insects and the study of their life-histories and possible connection with disease are almost essential for those who labour in our African Colonies and Protectorates.

Mr. Austin says in his Introduction that the material at present available in the British Museum is insufficient to allow of the publication of the Monograph on the subject which is eventually contemplated, but in the meantime it was felt that a work of this nature would be of service to those who are concerned with the investigation or prevention of disease in Africa.

No attempt has been made to give a detailed technical description of the species, but reliance is placed upon the beautiful illustrations as being sufficient to enable workers to identify the various biting flies found in their districts. The whole of Africa is dealt with, with the exception of Tripoli, Tunis, Algiers and Morocco, and the distribution of each species is most carefully recorded, as well as the most recent information available as to the bionomics of the insect concerned. A very useful feature is the inclusion of tables showing the species which have so far been reported from each country, colony, or protectorate, so that a worker in one of these may see at once the species which are known to occur in his own district.

The biting flies dealt with are the following: The *Chironomidæ*; the *Psychodidæ*, including a good account of the *Phlebotomus papatasi* which transmits the three-day fever of Dalmatia; the *Simuliidæ*; the *Tabanidæ* with their four principal genera—*Tabanus*, *Hæmatopota*, *Pangonia* and *Chrysops*; the *Muscidæ* and the *Hippoboscidæ*.

The majority of the species described are pictured in a series of thirteen coloured plates, which are drawn with an attention to detail beyond praise. The writer has been able to verify the accuracy of many of these figures by comparing them with specimens of the fifteen genera of African *Tabanus* now in the entomological collection of the Royal Army Medical College.

W. B. L.

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## Current Literature.

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**Catgut in the Field Medical Equipment of the German Army** (*Deutsch. Militärärztl. Zeitschrift*, July 20, 1909).—Specially prepared catgut is being introduced into the German field medical equipment. The material is boiled for five or six hours in boiling ether in a Soxhlet fat extraction apparatus, dried for forty-eight hours in a drying chamber at a temperature of 70° C. to 80° C., and then left for six hours in a special chamber at a temperature of 154° C. to 156° C. The chamber is double lined and connected with the outer air by two tubes, filled with calcium chloride, in order to enable any moisture in the catgut to escape from the chamber. The temperature in the chamber is raised by a special solution, *Kumol*, which is held in the space between the double lining and kept boiling at a temperature of 160° C. by a flame beneath the chamber. The catgut is kept in cardboard boxes during exposure to this heat. Each box contains five packets of catgut in filter paper, the packets having each two pieces of 20 inches in length. When the cardboard boxes are removed from the chamber, they are sealed with strips of paper and dextrin solution without being opened. Catgut thus prepared becomes as pliant as unprepared catgut, after it has been soaked in any sterile aqueous solution. In the dry state it is well adapted for use as suture material.

W. G. M.

**Plaster of Paris Bandages in the Field Medical Equipment of the German Army** (*Deutsch. Militärärztl. Zeitschrift*, July 20, 1909).—Plaster of Paris bandages are in general use now in the clinics and hospitals of Germany, and instructions have been issued for replacing the starch bandages of the medical and surgical panniers, &c., of combatant units and field medical units with an equal number of plaster of Paris bandages. Previously plaster of Paris bandages were left to be prepared on mobilisation. The instructions now require them to be prepared in peace. Each bandage is about 4 yards long and 4½ inches wide. The plaster of Paris is rubbed in by hand or by machine, and the bandage is placed in a cardboard box, sealed with strips of paper and dextrin. The whole is then dipped in paraffin melted at 50° C. to 52° C., and then allowed to cool and solidify for thirty minutes. Bandages in packages so prepared retain their properties even when kept in damp places.

W. G. M.

**The Gas Production of *Bacillus Coli*.** By Frederick G. Keyes (*The Journal of Medical Research*, July, 1909).

*Summary.*—(1) No definite quantitative results can be obtained by the

(2) The actual gas production of *Bacillus coli* when grown on synthetic and standard media in a vacuum and in the ordinary fermentation tube, for different time periods, may be averaged as follows:—

	Hours in Incubator 37° C.	Total gas produced per cent.	CO <sub>2</sub> per cent.	H per cent.	N per cent.
<b>Grown in synthetic medium:—</b>					
In vacuum apparatus .. ..	24	26·7	63·23	36·61	0·15
.. .. ..	48	45·6	63·27	36·05	0·67
.. .. ..	115	99·9	63·49	35·81	0·70
In fermentation tubes .. ..	70	11·1	40·30	57·69	2·00
.. .. ..	72	15·0	35·90	61·51	2·51
.. .. ..	100	12·4	38·14	59·04	2·82
<b>Grown in standard dextrose broth:—</b>					
In vacuum apparatus .. ..	48	196·8	55·73	43·56	0·70
In fermentation tubes .. ..	24	54·7	40·73	57·10	2·16

**Summary and Conclusions.**—While theoretically the use of hypnotics is promising for the prevention of anaphylaxis, it seems, from our work, that they offer little or no practical advantage for this purpose. We used in our experiments urethane, paraldehyde, chloral hydrate, and magnesium sulphate. These substances have practically no influence upon the fatal outcome of anaphylaxis. Further work upon the nature of anaphylaxis emphasises the specificity of this phenomenon.

It was found that heating dried horse serum to 130° C. for two hours, or 150° C. for ten minutes, or 170° C. for ten minutes, did not appreciably modify its toxicity for sensitive guinea-pigs.

Milk when dried may be heated to 130° C. for two hours, 150° C. for ten minutes, or 170° C. for ten minutes, and then found to be apparently more toxic than the unheated serum. Whole fluid milk may be heated to 170° C. for ten minutes, or 130° C. for two hours, without any apparent decrease in its toxicity.

Dried milk may be heated to temperatures varying from 130° C. for two hours to 170° C. for ten minutes and redissolved, and found to be as potent for sensitising as unheated milk.

Fluid milk may be heated to 130° C. for fifteen minutes, or 170° C. for ten minutes, without altering its sensitising properties.

Dried egg-white, whole or purified, may be heated to the same high temperatures without apparently altering its ability to sensitise guinea-pigs.

The substance known as anaphylactin, when dried, may be heated to at least 100° C. for ten minutes without destroying its power to sensitise guinea-pigs within forty-eight hours.

Animals injected with euglobulins prepared by one-third saturation with ammonium sulphate were not sensitive when amounts smaller than 0.001 cc. were used, while amounts larger than this sensitised guinea-pigs.

There is apparently no difference in the subsequent immunity, whether the intoxicating injection be given subcutaneously, intraperitoneally, or intracranially. In these cases the immunity was tested twenty-four hours after the second injection.

We present preliminary evidence suggesting that anti-bodies are concerned in the mechanism of anaphylaxis. The mixture of normal horse serum with the blood serum of a sensitive guinea-pig apparently increases the toxicity of the horse serum for sensitive guinea-pigs.

We have shown that guinea-pigs may remain sensitive one thousand and ninety-six days, that is, a little over three years.

[NOTE.—For details of experiments see *Hygienic Laboratory Bulletin*, No. 50, U.S. Pub. Health and Mar. Hosp. Serv., Washington, April, 1909.]

**Ueber Maltafieber in Deutsch-Südwestafrika.** Von Dr. Heinrich Werner, Stabsarzt in der Kaiserlichen Schutztruppe für Deutsch-Südwestafrika. (On Malta Fever in German South-West Africa. By Dr. Heinrich Werner, Staff-Surgeon in the Imperial Protectorate Force, German South-West Africa.) (*Archiv für Schiffs und Tropen Hygiene*, June, 1909, Bd. xiii., Heft 11.)

This article gives a detailed description of the first case of Malta fever reported from German South-west Africa. The patient was a police serjeant, aged 31, from Windhuk. His illness began on December 26th, 1907. He had been employed on a farm near Windhuk, and from the end of September to the middle of December had been in the habit of drinking daily fresh unboiled goats' milk. The milk was yielded by goats which were his only property, but he was unable to say whether they had been bred in the country or, as was more probable, imported from Cape Colony. He left hospital after sixteen days' treatment, his illness having been regarded as rheumatism. Some ten days later he was readmitted to hospital with fever, which lasted fourteen days. Apart from fever, the clinical symptoms were indefinite. He was able to do his duty till the beginning of May, 1908, when he again fell ill of fever. This access of fever continued without intermission until December, 1908. In September he was invalided home and came under treatment in the Institute for Tropical Diseases at Hamburg. With regard to the clinical symptoms, in the middle of June he suffered from pains in both legs and in the right ankle, and occasional pain in the shoulders and elbows. In addition this third access of fever was characterised by a fleeting roseolar and urticarial eruption, which came out as the temperature rose and disappeared as it fell. In spite of his long illness, the patient's strength

was fairly well preserved, though he became somewhat thin. He was treated by turns for malarial fever, syphilis, and septicæmia, without the course of the illness being affected in the least. In the beginning of October his blood was examined with the following results: no malarial parasites present; slight increase of large mononuclear leucocytes; red corpuscles 4,500,000 per cubic millimetre; white corpuscles 11,000 per cubic millimetre; hæmoglobin 85 per cent. Widal reaction negative for typhoid and for paratyphus *a* and *b*. Cultures made from blood drawn from a vein yielded no result.

On October 24th the question of the disease being Malta fever was taken into consideration. The result of agglutination tests undertaken with three strains of *M. melitensis*, two of Maltese origin and one from North Africa, was that the patient's serum agglutinated in  $\frac{1}{40}$  dilution with all three, and in  $\frac{1}{80}$  dilution with one of the Maltese strains. Agglutination tests carried out later yielded positive results with one of the strains of *M. melitensis* in  $\frac{1}{160}$  dilution.

On October 19th treatment by injections of Hetol was begun, 1 milligramme being injected to begin with, and the dose gradually increased to 5 milligrammes. After eighteen days of this treatment, each injection being followed by a pause of two to three days, the temperature fell and did not go up again. Dr. Werner does not claim that a cure was effected by Hetol, but thinks the drug should receive further trial.

As regards the existence of Malta fever in German South-West Africa, Dr. Werner says that he recollects two cases of fever, seen by him during the Herero rising, which were probably Malta fever, but were then regarded as relapsing typhoid. He recommends that all goats' milk should be boiled before use, and that goats imported into German South-west Africa from the Cape Colony should be subjected to veterinary inspection and control.

J. E. McN.

**Paratyphoid and Food-Poisoning Bacilli.** By F. A. Bainbridge (*Journal of Pathology and Bacteriology*, April, 1909).

PART I.—The differentiation of the paratyphoid and "food-poisoning" bacilli. The paratyphoid bacilli (*A* and *B*), *B. aertryck*, *B. sui pestifer*, *B. danysz*, *B. enteritidis gaertner*, and *B. typhi murium*, form a closely allied group of organisms; with the exception of *B. paratyphoid A*, they are morphologically and culturally indistinguishable from one another. They have been classified into sub-groups by their agglutination reactions, but the classification of different writers is not the same. The importance of determining the relationship of these bacilli lies in the fact that while some members of the group can produce disease in man, others are harmless. Bainbridge studied the morphological and cultural characters, and also used agglutination and absorption tests. As regards the absorption test for the differentiation of allied organisms, incomplete saturation of serum with bacilli and subsequent determination of its agglutination limits was considered more useful than complete saturation. As a result of his experiments Bainbridge concluded that:—

(1) The members of the paratyphoid and food-poisoning group of bacilli fall into four sub-groups, viz.:—

(a) *B. paratyphoid A*, which stands alone in both its cultural characters and its agglutination reactions.



(b) *B. paratyphoid* B, which is indistinguishable from *B. aertryck* and *B. sui pestifer* in its cultural characters and (usually) in its agglutination reactions, but can be differentiated from these two organisms by the absorption method.

(c) *B. aertryck* and *B. sui pestifer*, which cannot be differentiated from one another and which appear to be merely strains of the same micro-organism.

(d) *B. enteritidis gaertner* and *B. danysz*, which can easily be distinguished from the preceding sub-groups by their agglutination reactions, but which are indistinguishable from one another, and apparently also are only strains of the same organism.

(2) The uniform application of the absorption method is essential for the recognition of *B. paratyphoid* B and offers the only means by which it can be identified with certainty.

(3) *B. typhi murium* has no existence as a definite organism, since different strains alleged to be *B. typhi murium*, and obtained from accredited sources, were found to differ greatly in their bacteriological characters.

The inadequacy of the agglutination reaction for the differentiation of *B. paratyphoid* B is of importance in relation to the bacteriology of food-poisoning. Until the bacilli isolated in outbreaks of food-poisoning have been examined by the absorption method, in addition to cultural and agglutination reactions, the possibility that *B. paratyphoid* B can give rise to the usual symptoms of food-poisoning must be considered unproved.

PART II.—On the bacterial nature and efficiency of certain rat poisons. In this investigation, Raticide, Ratin Nos. 1 and 2, the Danysz virus, the Liverpool virus, and the Ready Rat Relief virus, were examined. It was found that all the viruses, with the exception of Raticide, owed their efficiency to bacilli indistinguishable from *B. enteritidis gaertner*, while the bacillus obtained from Raticide could not be distinguished from *B. aertryck*. When the rats were provided with abundant space, food and shelter, the destructive power of the viruses was inconstant; the death-rate in different experiments varied from 20 to 50 per cent. Under similar conditions phosphorus paste caused a higher mortality than any of the viruses, the death-rate varying from 61 to 67 per cent. The experiments also showed that a certain proportion of the rats fed on a virus become immune and would be unlikely to succumb to a second infection. Statements of the entire innocence of the viruses for man require justification.

### **An Epidemic among English Sparrows due to *Bacillus cloacæ*.**

By T. H. Glenn (*The Journal of Infectious Diseases*, June, 1909).

Summary and conclusion :—

(1) A bacillus isolated from the blood of sparrows during an epidemic among these birds was the probable cause of their death, since it was obtained in pure culture from all that died, and similar symptoms were produced in pigeons inoculated with it.

(2) By passing this bacillus through animals, its virulence was increased, so that it became pathogenic for guinea-pigs and rabbits.

(3) So far as can be determined from the description given by other observers, this bacillus resembles very closely certain bacteria isolated by them in bird epidemics and called by them *B. coli*, or coli-like organisms.

(4) The bacillus found in sparrows gives all the cultural characteristics of *B. cloacæ* (Jordan), a member of the proteus group.

(5) The serum of rabbits injected with the bacillus found in the sparrows will agglutinate the homologous organism in dilutions as high as 1 in 50,000.

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## Correspondence.

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### THE "TRAITEMENT À VIDE" OF ENTERIC FEVER.

TO THE EDITOR OF THE "JOURNAL OF THE ROYAL ARMY MEDICAL CORPS."

SIR,—With regard to Lieutenant-Colonel Cree's "vigorous protest" in the August number of the JOURNAL OF THE ROYAL ARMY MEDICAL CORPS against a recent note by me on the "Traitement à vide," I wish to state that my article was written in the hope that it would elicit from those who had tried the treatment more thoroughly than myself the reasons why my results—though well below the average as far as fatalities are concerned—were impaired by an abnormal number of relapses. Dr. Ewart in his notes on my article has given the reason; *i.e.*, I had failed to realise the importance of combining the local treatment of the intestinal ulcers with his method of "alimentation by inhibition." The art of medicine is largely learnt from our failures; and I submit that a medical man who is bold enough to record his lack of success in a special line of treatment should not be held up to scorn. Now that I am convinced of the cause of my non-success there is no firmer believer in the efficacy of the "Traitement à vide" than myself; in fact, I carry it out in all cases of intestinal ulceration apart from enteric.

In proof of this I would add that I have very recently read before the Orange River Colony Medical Society a paper on Dr. Ewart's method; and have had the honour of being requested to allow it to be published in their *Transactions*.

I am, &c.,

Tempe,

August 29th, 1909.

H. P. JOHNSON,

Major, R.A.M.C.

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### DISPOSAL OF PATIENTS SUFFERING FROM MALARIA.

TO THE EDITOR OF THE "JOURNAL OF THE ROYAL ARMY MEDICAL CORPS."

SIR,—In answer to Colonel Anderson's letter which appeared in the August number of the JOURNAL I give an expression of opinion.

The majority of malarial cases do well and improve in the hills. The climate of the low-lying hill stations (India) is ideal during the winter

months, and far better for most classes of invalids than the climate of the English winter.

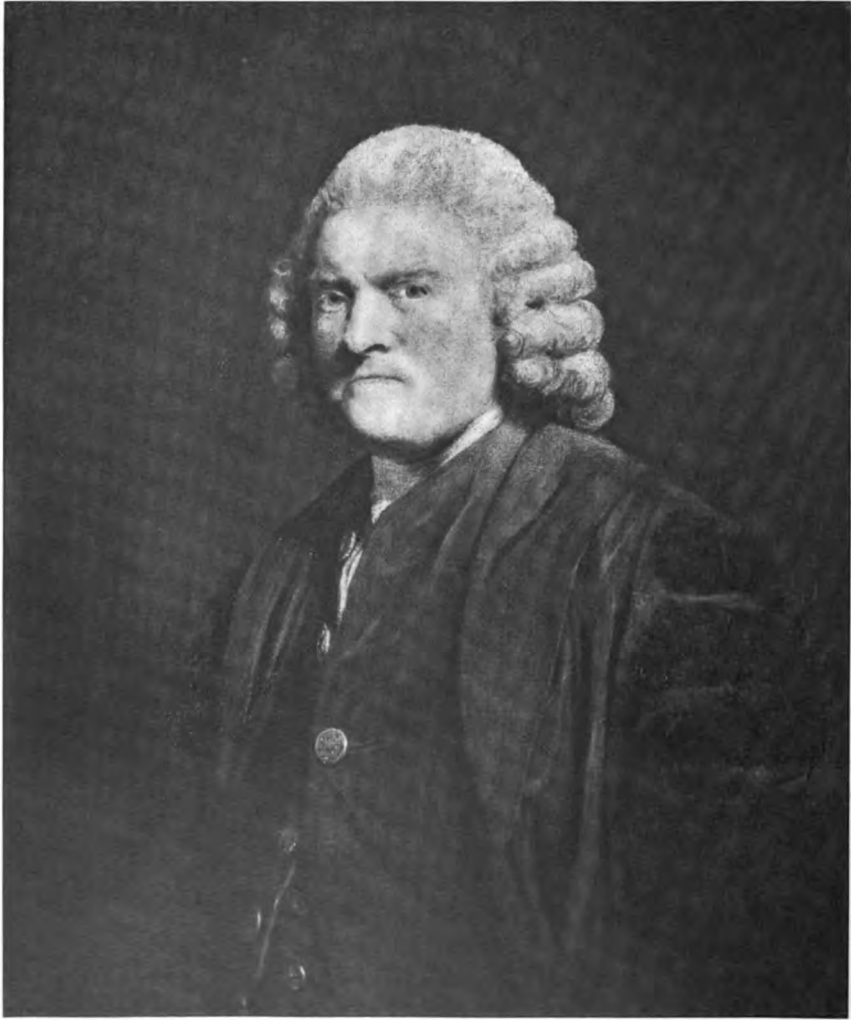
A patient suffering from the complication of symptoms described by Colonel Anderson should be invalided home, for discharge from the Service as permanently unfit—as in all probability he would never again make an efficient soldier. Such cases should not be invalided to the hills.

I am, &c.,

Mussorie, .  
September 14th, 1909.

OWEN E. P. LLOYD,  
Colonel.





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Journal  
of the  
Royal Army Medical Corps.

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Original Communications.

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SIR JOHN PRINGLE, BART.

BY MAJOR H. A. L. HOWELL.

*Royal Army Medical Corps.*

JOHN PRINGLE, the youngest son of Sir John Pringle, the second Baronet, of Stichel, Roxburghshire, by his wife Magdaeln, sister of Sir Gilbert Elliott, Bart., of Stobs, was born at Stichel House on April 10th, 1707. His father was one of a large family, several of whom were men of some prominence in their day, one being Secretary at War to George I., and another a Scotch Judge who achieved a barony. Young Pringle received his early education at home, but while still very young proceeded to St. Andrews, where his uncle Francis was Professor of Greek. Some years later—in October, 1727—he entered at Edinburgh University, where he remained for one year. It was intended that he should follow a commercial career, and, with that object in view, he was sent to Amsterdam. While there he paid a visit to Leyden, and, urged by curiosity, attended a lecture on medicine delivered by the celebrated physician, Boerhaave. This made such an impression upon him that he determined to adopt a medical career, and therefore entered at the University and became a pupil of Boerhaave, and of Albinus the celebrated anatomist. Whilst at Leyden he also became intimately acquainted with Van Swieten, author of the monumental commentaries on medicine which weigh down the shelves of many of the older medical libraries, who afterwards became famous as Professor of Medicine at Vienna and Physician to the Empress Maria Theresa. On July 20th, 1730, Pringle took his doctor's degree in medicine at Leyden, his inaugural thesis being entitled "*De Marcove Senili.*" This was afterwards printed. After studying for a time at Paris

he returned to Edinburgh and started practice as a physician. In March, 1734, he was appointed joint Professor of Pneumatics (metaphysics) and Moral Philosophy in the University, and delivered courses of lectures on these subjects. On the death of his colleague he became sole professor. He became acquainted with the Earl of Stair, and in 1742, when the latter took over command of the British forces in Flanders, Pringle became his private physician and was also appointed Physician to the Military Hospital in Flanders. By the terms of his commission Pringle received pay at the rate of £1 a day, and became entitled to half pay for life. During his absence from Edinburgh he continued to hold his professorship, his duties being carried on by deputy. He went through the campaign in Germany and was present at the Battle of Dettingen. Although it is probable that Pringle's position was practically that of Principal Medical Officer, it is rather surprising to read that during the battle he was in a coach with Lord Carteret. The explanation probably is that the day of battle is the surgeon's day, and there was therefore no call for the services of a physician. Apparently in those days the physician's duties lay within the walls of the hospitals, the surgeons alone doing duty on the field in addition to their work in the surgical wards of the hospitals. John Ranby, Serjeant-Surgeon to George II., was also present at Dettingen, and may have directed the medical arrangements in the field.

Pringle's patron, the Earl of Stair, retired in 1744. It is said that Pringle also wished to resign his appointment, but was not allowed to do so. Owing to the influence of the Duke of Cumberland, the Earl of Stair's successor as Commander-in-Chief, Pringle was, a few months later, promoted to be Physician-General to His Majesty's Forces in the Low Countries, and Physician to the Royal Hospitals in the same countries. Pringle now resigned his chair at Edinburgh. The outbreak of the Jacobite rebellion of 1745 led to the recall to England of large numbers of troops from the Continent. In the latter part of 1745 Pringle was recalled to accompany the Duke of Cumberland in the campaign which ended in the Battle of Culloden. He then returned to the British Army on the Continent and remained there for another two years, returning to England in the autumn of 1748, when peace was made with France.

Pringle now started practice as a physician in London, but remained in the Army, being appointed a director of and physician to Chelsea Hospital, where Ranby and Cheselden were also on the staff. He also attended the annual camps for three years. In April, 1749, he became Physician-in-Ordinary to the Duke of Cumberland.

He married in April, 1752, a daughter of Dr. Oliver, of Bath, after whom the celebrated Bath Oliver biscuit takes its name. Pringle had no children and, after only a few years of married life, was left a widower.

Pringle retired from the Army in 1758, and in the same year became Licentiate of the Royal College of Physicians of London. He received the Fellowship of the College on June 25th, 1763. Pringle's great reputation as a physician led to his appointment as Physician-in-Ordinary to the Queen's Household in 1761, and two years later he became Physician-in-Ordinary to the Queen. The year 1768 saw him Physician to the Dowager Princess of Wales, and in 1774 he became Physician to King George III., who had also in 1766 conferred the honour of a baronetcy upon him.

In addition to these honours from Royalty, Pringle had received recognition of his worth from his brother scientists. In 1745 he was elected a Fellow of the Royal Society, and served on the Council of that body in 1753. In 1772 he was elected President of the Royal Society, a position which he was well fitted to adorn, not alone by his scientific attainments, but by his social powers and his friendship with the leading minds of his day in England and on the Continent. As President of the Royal Society, Pringle showed great zeal in the furtherance of scientific research. He is said to have introduced the custom of delivering an annual address on the day on which the award of the Copley Medal was made. In these he commented upon many scientific investigations carried out in his time. These discourses, six in number—dealing with such varied subjects as Captain Cook's account of his means of preventing scurvy amongst his crew, Priestley's researches on gases, Walsh's experiments on the electric eel, and Nevil Maskelyne's studies of the force of gravity on the mountain of Schehallion—were afterwards published. Pringle was also welcomed as a member of several foreign learned societies, and was in 1778 chosen, in succession to Linnæus, as one of the eight foreign members of the Paris Academy of Sciences.

In 1778 Pringle's health began to fail, and in that year he resigned the Presidency of the Royal Society, being succeeded by Sir Joseph Banks. In 1781 he left London and took up his residence in Edinburgh; but, finding the climate did not suit him, he soon returned to London, where he withdrew from practice, and spent his days in social intercourse and in the entertainment of his friends at his club. On January 18th, 1782, he had an attack of apoplexy at his club, and died shortly after. He lies buried in St. James's, Piccadilly, and there is in Westminster Abbey a



monument, by Nollekens, erected to his memory at the expense of his nephew and heir, Sir James Pringle, of Stichel. Pringle had made a considerable fortune in the practice of his profession. In his will he left annuities to friends and relations amounting to £700 a year, the residue of his estate going to his nephew.

Pringle was a man of sterling integrity, honest in all his dealings, a strong friend, a charitable man, and in all respects a good man. He was intimate with most of the leaders in science and literature of his day, and numbered Priestley, Maskelyne, Franklyn, and Boswell amongst his friends. His house was, as Hutchinson, one of his biographers, says, "the resort of ingenious and philosophical men," "He was held in particular esteem by eminent and learned foreigners, none of whom came to England without waiting upon him and paying him the greatest respect. He treated them in return with distinguished civility and regard." Pringle was a great student of theology and unorthodox in his opinions. He ended by becoming a Unitarian. It was probably on this account that Dr. Johnson refused to know him although Boswell was his friend.

Pringle's contributions to medical literature were of great value. One of them has always been considered a medical classic not only in England but on the Continent. This is his great work, "Observations on the Diseases of the Army," which, first published in 1752, went through several editions, the last appearing in 1810, and was translated into French, Italian, and German. An American edition was annotated by Benjamin Rush.

Not very long ago the Italian Professor Monti wrote : "Pringle was one of the earliest supporters of the doctrine of the *contagium vivum* as the cause of disease in his remarkable works, 'Observations on the Nature and Cure of Hospital and Jail Fevers' (London, 1750) and 'On Septic and Antiseptic Substances'; the latter contains the first researches on the subject."

His three papers on "Experiments upon Septic and Antiseptic Substances, with Remarks relating to their Use in the Theory of Medicine," were contributed to the Royal Society and were awarded the Copley Medal. They are incorporated in the later editions of his work on "Diseases of the Army." The year before his death he deposited in the library of the Royal College of Physicians, Edinburgh, ten large folios in manuscript, entitled "Medical and Physical Observations." They include a "Treatise on Air, Climate, Diet, and Exercise." It is unfortunate that by the terms of his gift these volumes cannot be published by the College. It is probable that much valuable information concerning his military and civil practice lies buried in these manuscripts. In 1750 he pointed out,

in a letter to Dr. Mead, that jail fever is identical with typhus or hospital fever, and in the same year appeared his "Observations on the Nature and Cure of Hospital and Jail Fevers" (London, 8vo). In 1753 he contributed to the *Philosophical Transactions of the Royal Society* an account of an outbreak of jail fever in Newgate.

Pringle's portrait, by Sir Joshua Reynolds, is in the possession of the Royal Society, and a copy of it is now on the walls of the Royal Army Medical Corps Mess, London. It is also reproduced in "Pettigrew's Medical Portrait Gallery," vol. ii.

Sir John Pringle has found many biographers. His "Six Discourses" contain a life written by Dr. Kippis, and biographies of him can be found in the "Lives of British Physicians," Chambers's "Biographical Dictionary of Eminent Scotsmen," and in the "Dictionary of National Biography." The last was written by Dr. J. F. Payne. An excellent life also appeared in the "Pioneers of Public Health" series in the *Practitioner*, and is illustrated by a good portrait.

Sir John Pringle was unquestionably the father of modern military hygiene, and was the founder of modern military medicine as distinguished from military surgery. The publication of his writings apparently gave a great impetus to military medical literature, being followed in his own lifetime by the admirable works of Donald Monro, Richard Brockelsby, and Francis Home. George Cleghorn's work on the "Epidemical Diseases of Minorca" also belongs to this period.

A study of Pringle's works proves that he was aware of many facts in connection with military hygiene which most of us have considered as of comparatively recent discovery.

Pringle pointed out that dysentery and fevers often appear together in the same season. He considered scurvy amongst troops to be largely due to exposure to damp and "corrupted" atmosphere, and showed the advantages of removing sick troops from marshy districts to the seashore. He was the first to point out the superior health enjoyed by troops quartered on the higher floors of buildings when compared to the health of those on the ground floor. He attributed much of the sickness in the Army to the air from marshes; rotting vegetable matter about the camps, such as the straw upon which the men slept; the fouling of the ground of camps with animal excreta when dysentery was prevalent; and to overcrowding and bad ventilation in hospitals, barracks, and ships, particularly when those suffering from "putrid distempers" lived amongst the other troops. He recommended improvements in the soldiers' bedding, clothes, shoes, and an increased allowance of fuel.

He strongly advocated the frequent changing of camping grounds, recommended a system of messing for soldiers instead of having their meals apart, and considered it advisable that they should be allowed a certain amount of spirits or wine. Pringle was the first to suggest the encouragement of "diversions" or recreations amongst soldiers. He discusses at some length the question of seasoned *versus* unseasoned soldiers, and says that a regiment which has once been much weakened by sickness will never become properly fit for service until the sick and infirm are either dead or invalided, and that those corps which have suffered least from sickness during a campaign will be most fitted to undergo the privations of a second campaign. The system of general, field, and regimental hospitals has been attributed to Pringle, but this is certainly incorrect, for they existed before his time. It appears probable, however, that many improvements in their organisation were the results of Pringle's efforts.

The great discussion amongst Army medical officers and others of the merits and demerits of general hospitals as compared with field and regimental hospitals began with Pringle and continued until long after the end of our last war with France. Pringle writes of regimental hospitals that "they are of the greatest consequence," and should be maintained not only in the field but in winter quarters. In Pringle's day a winter campaign was most unusual; the armies fought during the summer and autumn, both sides retiring to quarters during the winter. Pringle says: "There is this advantage accruing from regimental hospitals, which is, that the several surgeons are best acquainted with the constitution and disposition of the patients as well as with the whole circumstances of their distempers," and continues: "As often as it has been tried I have observed it to be more successful than that of one large and general hospital." Pringle was practically the first to realise the important bearing of putrefactive processes on the production of disease.

Pringle's method of treatment of dysentery may be mentioned. He says that he first bled the patient and then "vomited him" with ipecacuanha, to which he often added tartar emetic.

In conclusion, it is believed that to Pringle is due the first foreshadowing of the Geneva Convention of our own day. The Earl of Stair, when commanding the British forces in Germany, it is said at Pringle's suggestion, proposed to the French commander, the Duc de Noailles, that the military hospitals on either side should be regarded as neutral, and mutually protected. This humane practice was observed throughout the campaign.

# MEDICAL HISTORY OF THE SOUTH AFRICAN WAR.

BY LIEUTENANT-COLONEL R. J. S. SIMPSON, C.M.G.

*Royal Army Medical Corps.*

*(Continued from p. 509).*

## THE COMPOSITION OF THE ARMY IN SOUTH AFRICA.

TABLE A, compiled from the Appendices to the Report of the Royal War Commission, shows the sources from which the Army in South Africa was derived and maintained.

Excluding the South African Colonials, whose numbers are uncertain, a total of 370,983 men were sent to South Africa, in addition to the original garrison (on August 1st, 1899) of 9,622 men.

It is impossible to distinguish accurately between the "seasoned" and "unseasoned" troops composing this force, but grouping them on broad lines, the following is probably the order of *increasing* susceptibility to epidemic disease of the components of the Army in South Africa :—

- (1) Regulars and Volunteers from India.
- (2) Colonial Contingents and S.A.C. from Canada: garrison, South Africa.
- (3) Regulars from the Colonies.
- (4) Militia from the Colonies.
- (5) Regular units from home to December 31, 1900.
- (6) Regular units from home after December 31, 1900.
- (7) Drafts of Regulars  
       Militia Units and Drafts  
       Imperial Yeomanry  
       Volunteers  
       Scottish Horse  
       S.A.C.

} from home.

There may be some difference of opinion as to the exact sequence of the first six items, but the important point appears to be that the sources shown under (7) furnished a total of 205,803 men, or more than half (55 per cent.) of the total number sent to the country, and whatever opinion may be held as to the relative susceptibility of the other groups, there is no doubt that this large proportion of the total strength was almost entirely without any acquired immunity against climatic disease. The only point of uncertainty here appears to be as to the number of men sent out as

"drafts," who had previously been in the country and returned to it after having been invalided home, often on account of enteric fever.

The first year of the War, that is, up to the end of December, 1900, is the most interesting and difficult in respect of the composition of the force. Of 238,877 N.C.O.'s and men (including the garrison on August 1st, 1899) sent to South Africa up to December 31st, 1900, 171,702 went out with formed units and 67,175 with drafts (*vide* Table B).

Of the 171,702 who went out as formed units, 122,898 were regulars, and of these 42,957 belonged to the Army Reserve. Of the 67,175 who went out in drafts, 62,325 were regulars, and of these at least 18,414<sup>1</sup> belonged to the Army Reserve, while 13,014 belonged to the Militia Reserve. Thus there was during this period a considerable leaven of older men (35 per cent. excluding the Militia Reserve) less liable to epidemic disease. The supply of Reservists ceased in September, 1900.

Up to the end of 1900 the main features were—the preponderance of the trained soldiers of the Regular Army (including many Reserve men) sent out in formed units; the addition of a large number of Militia (18,413 for the Line of Communication) and of a large number of Imperial Yeomanry and of Volunteers of a good stamp.

As regards the Regular Forces, the drafts for the Cavalry and Artillery were generally of the normal composition as to age and service. For the Infantry, in addition to the normally qualified drafts, some immature soldiers were sent (between May and June, 1900) for duty with Militia on the Line of Communication.<sup>2</sup> The minimum qualification for these "immature" men was three months' service and 18 years of age. For the other drafts the standard, "with a very few exceptions," was one year's service and 20 years of age, but about October, 1900, the service qualification was reduced to nine months, at least for some battalions. During the second year, "as the War appeared to be nearing a close," all available men irrespective of age, but over six months' service, belonging to reserve squadrons and dépôts of Cavalry regiments, which would be detained in South Africa on the termination of the War, were sent out. Similarly for the Infantry, all "details" of regiments

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<sup>1</sup> Cavalry, Infantry and Artillery only, *vide* p. 87, Appendices, Royal War Commission.

<sup>2</sup> p. 84, Appendix No. 5, Royal War Commission.

which were to remain in South Africa were sent out. It was stipulated in both these cases that these men, unqualified by age and service, were to be kept back from the front.

In January, 1901, it was decided to send out all available Cavalry soldiers, and in some cases the age qualification was reduced to 19½ years. No Infantry drafts were sent out during the first four months of 1901, but some sent in May included a certain number of mobilised reservists. In June the sending out of drafts was resumed, the age qualification being raised to 20 years.

In November, 1901, all available Cavalry soldiers were sent out. In April, 1902, the age qualification for both Cavalry and Infantry was again reduced to 19.

Shortly after the War had lasted a year "the only available drafts were the men who, month by month, attained maturity, or those who had been invalided home and had recovered."<sup>1</sup> But "maturity," as shown above, varied from time to time, according to the needs of the Army.

The average annual intake of recruits for each Cavalry regiment in South Africa during the three years of the War was about 200. It was considerably less for the Infantry.

The Reserves were exhausted by the end of the first year of the War, and the wastage had to be made good by recruits as they attained a minimum standard, which, never high, was at times dangerously low. The year between 19 and 20 makes a great difference in the stamina of the young soldier. On the other hand, it should be pointed out that the number of recruits in the older age groups was greater during the War than in normal periods; older men were enlisting, so that the proportions of those who barely reached the minimum standard was smaller during the War than would have been the case under normal recruiting conditions.

As regards the physical condition<sup>2</sup> of the men of the Regular Army, the Cavalry and Artillery appear to have been good throughout. As to the Infantry, the average physique of the regiments was good as they first arrived in South Africa; this was in great measure due to the large proportion of Reservists that they contained. Later on, the physique of the drafts was not satisfactory, partly owing to their youth, but also to some extent owing to indifferent material.

There seems to be little doubt that the minimum qualification

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<sup>1</sup> Appendix 5, Royal War Commission, p. 86.

<sup>2</sup> *Vide* p. 41, Report of Royal War Commission.

of 20 years of age and one year's service should invariably be insisted on. Of the two, the period of service would almost appear to be the more important, certainly, at least as regards town-bred recruits. The good and sufficient food with healthy surroundings and regular exercise, quite apart from the moral influence of the soldier's life, make a vast difference in the physical condition between the recruit on joining and the (partially) trained soldier of a year or more service.

The Militia were, generally speaking, inferior to the Line. This was partly owing to the lower age limit—18 years of age. It was at first proposed to make the age limit 19, but this difference of a year would have made one-third of the men unavailable.<sup>1</sup>

The Imperial Yeomanry<sup>2</sup> went out in three contingents, the first, of about 10,000 men, early in 1900, the second, about 17,000, in the spring of 1901, and the third, about 7,000, in the winter of 1901-02.

The age limits and physical standards were the same in all, 20 to 35 years of age, and the measurements of the Regular Forces, the only relaxation as regards the medical examination being that, in relation to the short term of their engagement, it was "sufficient that the candidate should be free from organic disease or other defect likely to prevent him doing his work during the duration of the present War."<sup>3</sup>

The physique of the first contingent was "excellent and far above that of the Regular Army." The second contingent were not so satisfactory in this respect: their examination was not carried out by the regular recruiting medical officers,<sup>4</sup> and the third contingent contained a proportion of physically inefficient men, who should never have enlisted.

The age qualifications for the Volunteers were the same as for the Imperial Yeomanry, and here too the same variation in the quality of the men was observed as in the Imperial Yeomanry (and indeed in the drafts for the Regulars); as time went on the proportion of inefficients who were sent out steadily increased in all three bodies.

As regards the Colonial troops: the over-sea Colonials and the earlier regiments of South African Colonials were good. Later on a large proportion of the men enlisted in the South African Irregular

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<sup>1</sup> Report of Royal War Commission, p. 63.

<sup>2</sup> *Ibid.*, pp. 70, &c., '99.

<sup>3</sup> Special Army Order, dated January 2nd, 1900.

<sup>4</sup> R.W.C., vol. i., 5384.

Forces were physically unfit for service, and only blocked the hospitals.<sup>1</sup>

Under the ordinary conditions of military service during peace, a constant process of elimination of the less fit is going on; the greater incidence of disease of all kinds on the young soldier in the earlier years of his service is of course familiar. Abroad, this process is accelerated by climatic disease, in which one may, for convenience of designation, include enteric fever and dysentery. During war, this elimination is more rapid owing to the greater stress and the more frequent opportunities for infection, but heretofore our armies in the field have been composed mainly of units from whom the greater proportion of the unfit have been weeded by natural processes, and who were at least familiar with the ordinary details of camp-life, and accustomed to the restrictions necessitated by a life in common. In the late War, the conditions were very different: over half the field force was composed of the raw material of an army; in it no natural selection had taken place; the individuals of which it was composed were without knowledge of a mode of life independent of civilisation, and in many cases impatient of restrictions, beneficial to themselves and their fellows, whose purport they did not understand.

Hence it followed that the natural process of elimination, which normally spreads over the first lustrum, accelerated by fatigue and privation, by exposure to a widespread infection, was compressed into the shorter period during which each body remained in the country. Such must be the case in all campaigns, but in none of which we ourselves have any experience has the proportion of the raw material to the finished article been so great. This difference must be remembered in considering the incidence of disease, and comparing it with that found in other campaigns.

#### THE SANITARY ORGANISATION.

(1) *The Personnel.*—The system in vogue at the beginning of the War, and indeed during the whole period, provided every Commanding Officer, of whatever degree, with a sanitary adviser, and the chain of responsibility in sanitary matters ascended by links similar to those in command. But, as has been pointed out already, the initiative of the officers of the medical service was limited to recommendations; they had no executive powers,

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<sup>1</sup> *Vide* also Report on the Medical Arrangements, South African War, pp. 209 and 210.



which was fortunate in one way, as they possessed no staff to carry out their wishes. The only *personnel* provided for sanitary work was, so far as smaller matters were concerned, the regimental pioneers and their fatigue parties, while for more extensive operations the aid of the Royal Engineers had to be invoked. There was no general scheme for the purification of water, although in individual units arrangements were made which acted well. The sanitary duties of the various officers, according to their degree, were laid down in detail in the Regulations for the Army Medical Services for 1897 and 1900, which together covered the whole period of the War. Many of these duties, in the case of administrative officers, were carried out by deputy, but the final responsibility rested with the administrative officer, forming an important addition to his already onerous task, and rendering it impossible for him to supervise both sides of his work in detail. Much of his work had, of necessity, to take priority; movements of troops, arrangements for the medical attendance of sick and the provision of accommodation for them, of *personnel*, medical and nursing, are all duties which come directly under the public eye. Preventive medicine is not so obvious in its immediate results, and hence when time only permits of one portion of the work being done, that portion of which the result can be seen by the least instructed is the more likely to be carried out, for no measures which may diminish future sickness will counterbalance any apparent neglect to provide for the immediate comfort of those who have already fallen sick. The obvious remedy is to remove this responsibility for details on the sanitary side from the administrative medical officers, which has now been done.

Further, many of the duties assigned by these regulations to the Principal Medical Officer of a division cannot be carried out in the field, for the very sufficient reason that the occupation of towns, of villages, of certain sites for camps, the discrimination between various sources of water supply and the like, are all matters so much dependent not only on the movements of our own troops, but of those of the enemy, that military necessities often render the occupation of certain places incumbent, whatever their sanitary defects. No doubt the words "military necessity" have in the past been used to cover want of foresight, errors in judgment or even absolute neglect of precautions that might have been taken, but even with this proviso, the fact remains that field sanitation must always be very much subject to the chances of war, as much determined by the enemy as by ourselves, and its area must be limited by the line of contact with the enemy.

It says much for the knowledge, energy and influence of the officers of the medical service that in the past a system so fragmentary and incomplete should have attained the excellent results which it did. But the magnitude of the operations in South Africa, their duration, and above all the small proportion of the trained officers of the medical service, showed distinctly that such a system must be replaced by one more suited to modern requirements, where a certain *personnel* of all ranks of the medical service is definitely detailed for sanitary duties, and where every individual in the field, as far as he can, assists in the maintenance of proper conditions.

(2) *Equipment*: (i.) *Regimental*.—The ordinary ordnance equipment of a unit included all the implements necessary for the pioneer work of the unit, including the making of latrine trenches, &c., and also a number of camp kettles for cooking, which served for boiling the drinking water also when fuel was available. In the later stages of the War additional camp kettles were issued for this specific purpose.

(ii.) *For the Supply of Water*: (a) *Water-carts*.—According to “War Establishments, 1898,” water-carts were only allotted to the various supply columns of the Army Service Corps, and to the Bearer Companies and Field Hospitals, on the following scale; none were allotted to units:—

	No.
Cavalry Brigade Supply Column .. .. .	1
Infantry Brigade Supply Column .. .. .	3
Divisional Supply Column .. .. .	2
Corps Troops Supply Column .. .. .	2
Bearer Company .. .. .	1
Field Hospital .. .. .	1

giving the following totals for—

Cavalry Brigade .. .. .	3
Infantry Brigade .. .. .	5
Infantry Division .. .. .	13
Army Corps .. .. .	50

The following note is made concerning these water-carts: “A 5. Water-carts, forming part of the establishment of supply columns, are intended for general use. They will be distributed according to the orders of the General Officer Commanding. For campaigns in hot countries, the number of water-carts will be increased if considered necessary.”

The number authorised at the onset of the South African War is given in the “Organisation and Details of Transport,” Capetown, 1899, which includes the following preliminary note on p. 5:—

“(vii.) Water-carts.—Although water-carts have been allotted to different units it must be understood that they are available for general use in brigades, &c., as the General Officer in Command may direct.”

The following is the scale then authorised :—

	No.
Cavalry Regiment .. .. .	1
“ “ Headquarters with Corps Troops .. .. .	1
Ammunition Column, Corps Troops .. .. .	2
“ “ others .. .. .	1
Royal Engineers, Field Company .. .. .	1
“ “ Field Troop .. .. .	1
Mounted Infantry, Staff .. .. .	1
Infantry Battalion .. .. .	1
Army Service Corps Company, Corps Troops .. .. .	2
Supply Columns, Divisional .. .. .	2
“ “ Cavalry Brigade .. .. .	1
“ “ Infantry Brigade .. .. .	3
“ “ Auxiliary, L. of C. .. .. .	4
“ “ Supply Park .. .. .	2
Field Hospital, Corps Troops and Brigades .. .. .	2
“ “ others .. .. .	1
Bearer Company .. .. .	1

On the reorganisation of the transport, a new system was introduced (Army Order 4, of January 24th, 1900), and the new scale was authorised in Army Order 2, of January 29th, 1900, as follows :—

	No.
Each Cavalry Regiment .. .. .	1
Each Ammunition Column .. .. .	1
Mounted Infantry, each Regiment, or Colonials or Imperial Yeomanry, four Companies or Squadrons .. .. .	1
Royal Engineers, Bridging Troop .. .. .	1
Field Troop .. .. .	1
Field Company .. .. .	1
Infantry, each battalion .. .. .	2
Bearer Company .. .. .	2
Field Hospital .. .. .	2
Supply Column .. .. .	2

This scale remained in force till the end of the War, though the actual numbers provided varied with the local circumstances from time to time.

(b) *Water Equipment of the Royal Engineers.*—This is given in Table 15, Equipment Regulations, Part II., Section 10, Engineer Details, as follows :—

	No.
Troughs, water-proof, 600 gallons, Field Troop .. ..	3
" " " " Field Park.. ..	6
Pumps, lift and force (to 60 feet), Field Troop .. ..	1
" " " " Field Park.. ..	2
" Tripod, Field Troop .. ..	3
" " Field Park .. ..	3
" " Field Company .. ..	1
Wells, 1½ inch, Bridging Battalion .. ..	1
" " Field Park .. ..	4
" apparatus, driving, Bridging Battalion .. ..	1
" " " Field Park .. ..	2

In addition to this, the regulation equipment, a large quantity of material and machinery for use in connection with water supply was sent out from England in October, 1899, and further supplies were despatched throughout the campaign.<sup>1</sup>

The "well, 1½ inch," is the "Norton tube well," and it is designed to obtain water from a moderate depth. With an ordinary lift pump it is applicable where the water level is not more than 28 feet from the surface; with the deep well pump and working barrel, it is applicable where the water level is not more than 80 feet from the surface. These wells cannot be driven through rock or large stones, but they have been driven through chalk and very hard beds of flint and gravel. Five men are required to drive the well quickly, and the rate of progress varies from 12 feet per hour in flinty chalk to 20 feet per hour in soft soil. The yield with a suction pump in good condition is up to ten gallons per minute from a depth of from 20 to 28 feet. But they are only effective where there is a good flow of water from the outside into the lower end of the pump; where the strata are very porous, *e.g.*, in gravel and some sorts of chalk where water flows freely, the yield may be up to the capacity of the pump as given above, but in other soils, such as sandy loam, there may not be enough to supply the pump.

The conditions in the area of operations were not favourable to the success of these appliances; the soil and subjacent strata are not suited for them, and the water is frequently at a lower level than that at which the pump is designed to work, or indeed at which a simple pump can work at such higher altitudes.

A good deal was said about the neglect to put down boreholes at Paardeberg and elsewhere. Some boreholes had been made on the western line before this, and many were put down at later periods; all that need be said here is that the process is a long

<sup>1</sup> *Vide* Appendices of the Report of the Royal War Commission, pp. 206 to 209.

TABLE A.—COMPOSITION OF FIELD FORCE, SOUTH AFRICA.  
Sources from which Troops were drawn.  
N.C.O.'s and Men.

	To 31.12.00	1.1.01 to 30.9.01	1.10.01 to 31.12.01	1.1.02 to 31.5.02	Totals	
<i>Home.</i>						
Regulars, Units ..	98,826	5,265	3,506	956	108,553	Regulars.
Drafts ..	62,325	14,928	5,547	18,527	101,327	
Imperial Yeomanry, Units ..	9,713	16,553	625	6,751	33,642	Imperial Yeomanry.
Drafts ..	482	..	..	..	482	
Militia, Units ..	18,413	6,060	4,179	9,562	38,214	Militia.
Drafts ..	3,197	57	..	1,603	4,857	
Volunteer Service Co.'s., Units ..	8,096	5,975	..	2,446	16,517	
Drafts ..	1,024	..	..	..	1,024	
C.I. Volunteers, Units ..	1,520	..	..	..	1,520	Volunteers.
Drafts ..	147	..	..	..	147	
Scottish Horse ..	..	225	221	371	817	Scottish Horse.
S.A. Constabulary ..	..	5,767	1,109	380	7,256	S.A. Constabulary.
	203,743	54,830	15,187	40,596	314,356	—
<i>India.</i>						
Regulars ..	7,403	..	3,749	958	12,110	Regulars.
Drafts ..	..	..	..	5,551	5,551	
Volunteers ..	289	..	..	..	289	Volunteers.
	7,692	—	3,749	6,509	17,950	—
<i>Colonies.</i>						
Regulars ..	7,047	680	1,189	..	8,916	Regulars.
Colonial Contingents ..	10,773	6,337	..	10,317	27,427	Colonial Contingents.
Drafts ..	..	321	..	..	321	
Militia ..	..	804	..	..	804	Militia.
S.A. Constabulary (Canada) ..	..	1,209	..	..	1,209	S.A. Constabulary.
	17,820	9,351	1,189	10,317	38,677	—
South African Colonials ..	..	..	..	..	..	Raised between 11.10.99 and 30.4.01. Later numbers uncertain.
Garrison, South Africa ..	9,622	..	..	..	9,622	—
Total ..	238,877	64,181	20,125	57,422	380,605	430,695
	Pages 61, 62, App. R.W.C.	Page 69, App. R.W.C.	Page 73, App. R.W.C.	Page 79, App. R.W.C.		

Note.—There are certain small differences in these totals as compared with those given in other tables of the Report of the R.W.C., but their aggregate amounts to less than 200 men, which may be neglected.

TABLE B.—COMPOSITION OF FIELD FORCE, SOUTH AFRICA.  
Detail during First Year.  
N.C.O.' and Men.

Group	Dates	REGULARS			Militia	Other Corps	Grand total	Remarks
		Colour Service	Reserve	Total				
Garrison, South Africa ..	1.8.99	9,622	..	9,622	..	..	9,622	—
Reinforcements, 1st ..	20.9.99	1,744	..	1,744	..	..	1,744	954 Gibraltar, 790 Home.
„ 2nd ..	2 to 30.10.99	10,263	..	10,263	..	..	10,263	Home, India, and Mediterranean.
Field Force ..	27.10 to 29.12.99	26,492	20,589	47,081	..	..	47,081	—
Reinforcements, 3rd ..	8.12 to 14.12.99	2,030	1,311	3,341	..	..	3,341	—
5th Division ..	15.12.99 to 10.1.00	5,252	4,612	9,864	..	..	9,864	—
Brigade Division, R.H. Artillery	10 to 25.1.00	514	220	734	..	..	734	—
6th Division ..	7 to 21.1.00	5,101	3,476	8,577	..	..	8,577	No Section "D."
7th Division ..	23.1 to 11.3.00	4,406	4,772	9,178	..	..	9,178	Included Section "D."
4th Cavalry Brigade ..	1 to 20.3.00	1,580	935	2,515	..	..	2,515	Not included in Appendix 8, R.W.C.
Reinforcements from India ..	21.1 to 13.12.00	1,759	..	1,759	..	..	1,759	—
4th Brigade Division, R.F. Arty.	12 to 24.2.00	1,058	1,471	2,529	..	..	2,529	—
Militia for L. of C. ..	29.1 to 13.2.00	..	..	..	4,877	..	4,877	—
Siege Train and Heavy Artillery	26.12.99 to 3.5.00	1,539	611	2,150	..	..	2,150	—
With Units not included above	.. ..	2,093	511	2,604	..	..	2,604	—
Militia for L. of C. ..	1.3 to 28.6.00	..	..	..	13,536	..	13,536	—
Reinforcements from Mediterranean	20 to 25.3.00	1,192	930	2,122	..	..	2,122	—
8th Division ..	3.4 to 10.5.00	5,296	3,519	8,815	..	..	8,815	—
C.I. Volunteers ..	29.1.00	..	..	..	..	1,520	1,520	—
Volunteer Service Co.'s ..	to	..	..	..	..	8,096	8,096	—
Imperial Yeomanry ..	28.6.00	..	..	..	..	9,713	9,713	—
Colonial Contingents, 1899, 1900	.. ..	..	..	..	..	11,062	11,062	—
Formed Units ..	.. ..	79,941	42,957	122,898	18,413	30,391	171,702	—
Drafts ..	.. ..	30,897	18,414	49,311	9,197	1,653	54,161	• Militia Reserve.
			13,014*	13,014			13,014	Reserves not embarked after September, 1900.
Total ..	.. ..	110,838	74,385	185,223	21,610	32,044	238,877	—

The total strengths are from Appendix 4, R.W.C.  
The details from Appendix 8, R.W.C.

one, and the result, both immediate and remote, somewhat problematical. This question will be considered in detail later.

(c) *Filters*.—Filters have not formed a part of the normal equipment of a regimental unit on field service, mainly on account of the difficulty of obtaining a good pattern. Various patterns have been issued at different times, but none have been satisfactory. For the late War it was proposed to issue the "Berkefeld" filter, one to each company or similar unit of 100 men. Owing to difficulties in the supply of the large number required, this standard could not be maintained and many of the regimental and other units landed without these filters. The supply was increased later, and in addition a similar filter of a somewhat different pattern (Messrs. Slack and Brownlow's) was issued to some units. The practical employment of these filters will be dealt with later.

(iii.) *Disinfectants*.<sup>1</sup>—The following were held on charge by the Army Service Corps for issue "when available and certified as necessary."

"For every 1,000 British troops per day :—

Carbolic acid powder	..	..	..	..	..	lb. $\frac{1}{4}$
Chloride of lime	..	..	..	..	..	lbs. 2
McDougall's disinfectant powder	..	..	..	..	..	lb. 1
Izal	..	..	..	..	..	gallon $\frac{1}{2}$

"Medical officers will be careful to adhere to these scales as far as possible."<sup>2</sup>

In addition the Army Service Corps obtained perchloride of mercury or crude carbolic acid for disinfecting purposes when required.

These supplies were almost always available in sufficient quantity.

(iv.) *Hospital*.—Two Thresh's steam disinfectors were sent out at the beginning of the campaign (in November, 1899), of which one was destined for No. 1 General Hospital at Wynberg, while the other was sent to Natal. The number of these was steadily increased during the campaign, when each general hospital (and most of the stationary hospitals) was provided with one.

(v.) These details refer only to the organization and equipment of the field force as despatched from England.

(*To be continued*).

<sup>1</sup> P. 385, Report on the Medical Arrangements.

<sup>2</sup> Army Standing Orders, with Army Order 4 of November 6th, 1899, and continued to April 1st, 1902.

## SOME MODERN VIEWS CONCERNING HEREDITY AND VARIATION.<sup>1</sup>

BY BREVET-COLONEL R. H. FIRTH.  
*Royal Army Medical Corps.*

IN attempting to discuss this subject before you I ask your indulgence for any crudities which my remarks may present. The extreme interest and importance attaching to the problem of heredity and variation of species is the sole excuse I have to offer for discussing the subject at all. Speaking for myself, I may say that from my early student-days the subject has been of absorbing interest, and, as one has grown older and more experienced, the mysteries associated with the problem of the origin of life and the reproduction of somatic units from single germ-cells have lost none of their fascination for me. Doubtless, to more than one here present the same is equally true.

At the outset, let me ask you, what do we mean by inheritance and variation? Limiting ourselves to the conception of organisms only whose offspring develop by processes of growth from a minute fragment detached from the parent organism, we mean by inheritance, the manner by which the nature and characteristics of an organism are handed on to its offspring. On the other hand, variation means the manner or circumstances by which members of the same species differ from each other. Of course, some of the differences may arrive late in life and be the result of education or environment, but the mere fact that offspring may differ at the outset from their parents suggests the possibility, in the course of generations for progressive changes to take place, so that from the offspring of members of the same species entirely new species may arise. It is obvious that we are here face to face with the larger question of organic evolution. It is not my intention to take you into this thorny field of debate, but merely remind you that it has been generally accepted that the various forms of life, with which we are familiar, owe in great measure their present characteristics to the accumulation of a series of changes similar to those which are still in progress. This theory of evolution, as opposed to an hypothesis of creation, is supported by numberless facts familiar to you all, and finds expression in the teaching of Wallace, Darwin,

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<sup>1</sup>Being an address given before the Aldershot Military Medical Society, on November 15th, 1909.



and Weismann, wherein it is assumed that in the course of generations a steady or continuous change in the characters of a species takes place and follows the direction of best adaptation to new conditions.

This conception admirably covers the case of individual variations which affect every character, or what are termed normal or continuous variations; but it fails to explain satisfactorily abnormal, definite, and discontinuous variations and perpetuation of types arising from them. The view that the evolution of a new species could occur by the help of a mutation or variation of the discontinuous kind dates back to the time of Aristotle, and in recent years has been supported by the work of de Vries, Bateson, and others who maintain that by a single step new forms can arise which have already the definite characters associated with a species adapted specially to particular conditions. From these new forms those best fitted for their environment will survive, while those which are less fitted will disappear by the action of natural selection. While the origin of a new organ is inexplicable by the Wallace-Darwin theory, the explanation of its inception by a mutation theory offers few difficulties, especially as changes of a closely similar nature have been observed actually to take place.

Having, so far, reminded you of the main principles or theories of evolution which are affected by our ideas of heredity and variation, I would next ask your attention to more recent work on these subjects, so that we may see on what lines it has proceeded and how far it has succeeded in making the problem of heredity and variation clearer. To appreciate the drift of this newer work we must bear in mind that the organism is a complex unit, into whose make-up there are concerned somatic plasm and germ plasm, both of these tissues being intimately associated the one with the other. Our conception of the nature of inheritance must clearly be guided or affected by how far we admit the influence of the somatic cells on germinal matter or the effect of germinal plasm on somatic plasm. I question whether any of you seriously entertain the possibility of the former idea or doubt the isolation of the germ cells from the somatic influences. This latter view is the fundamental theme of Weismann's theory, in which he regards the germ plasm as continuous from one generation to another, but endowed with a potentiality for variation, within certain limits, which can be called forth by a suitable environment. In dividing cells, the chromosomes contain the germ plasm of the species, and are identical in male and female reproduction cells, and so

long as their number is complete or sufficient to enable conjugation to take place it is immaterial from which parent they may come.<sup>1</sup> According to Weismann's theory the chromasomes are *idants* and built up of *ids*; these again are made up of *determinants*, which again are composed of *biophors* or ultimate units or ultimate molecules of inherited plasm.<sup>2</sup> As development advances, the *ids* are disintegrated into *determinants* and the *determinants* into *biophors*, each group getting smaller and smaller until every *biophor* ultimately reaches and controls its own cell. To apply Sedgwick's analogy, this conception may be compared to the splitting up of a battalion into half battalions, then into companies, and these, again, into pickets or individual soldiers.

In its main features, this theory of Weismann's has been universally accepted, but it involves the assumption that all ancestors of the same degree, such as grandparents, make a substantially equal contribution to the hereditary qualities of the offspring. This aspect of the question has been much developed by Karl Pearson and other biometricians,<sup>3</sup> who, working purely from the mathematical point of view, have evolved a main generalization known as the *law of ancestral inheritance*. This law states that the average degree of resemblance between an individual and any particular ancestor is capable of definite numerical expression as co-efficients of correlation. Thus, the mean correlation between the two parents and the offspring, the four grandparents and the offspring, the eight great-grandparents and the offspring and so on are stated to diminish in a geometrical series, which is the same for all characters. The actual amounts of these correlations are calculated by Pearson in the form of the diminishing series 0·6244, 0·1988, 0·0630, &c. He further calculates that, if ancestors be selected in each generation showing a definite deviation from the general mean of the population, after one generation of selection the immediate offspring will show 0·62 of the character selected; after two generations they will show 0·82, after three 0·89, and after a great number of generations 0·92 of the heritable character.<sup>4</sup> So that in a few generations the development of a character may be raised to within 90 per cent. of the value selected

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<sup>1</sup> Boveri, "Ergebnisse ueber die Konstitution der chromatischen Substanz des Zellkerns," 1904.

<sup>2</sup> Weismann, "Essays upon Heredity," 1889; also, "The Evolution Theory," 1906.

<sup>3</sup> Galton, "Natural Inheritance," 1889.

<sup>4</sup> Pearson, "The Grammar of Science," 1900.

but, after this, further selection has little effect. He also calculates that in-breeding of a selected stock is followed by a very gradual return towards the mean character of the original race. It is difficult to say how much reliance can be placed on these theoretical conclusions, as they assume the existence of perfect normal variation, and that the contribution of each ancestor of the same degree to the hereditary endowment of the offspring has been exactly equal. Since both these assumptions are unlikely to be realized in an actual case, it would be wiser to regard the statement as an approximate indication only of what is likely to occur.<sup>1</sup>

Whatever may be the precise value to be placed on the work of the biometric school, it suggests the interesting conclusion that, on the basis of a normal continuous variation, selection, as productive of new types, is a diminishing influence. If this be so, how do new varieties arise? Is it possible that Nature makes jumps sometimes and so creates new species? Huxley<sup>2</sup> writes, "That Nature does make jumps now and then, and a recognition of the fact is of no small importance in disposing of many minor objections to the doctrine of transmutation." It is in this connection that the work of de Vries and Mendel is so interesting. The former,<sup>3</sup> experimenting with *Oenothera lamarckiana*, showed that out of some 50,000 individuals which were grown to a recognisable stage, more than 800 showed mutations, that is to say, they differed specifically from the parent *O. lamarckiana*. When they had once made their appearance, the majority of the new types came true to seed. Time and space do not permit of a full analysis of de Vries' work, but he formulates the following main conclusions: that new species arise suddenly at a single step, without transitional forms; that the mutations take place indefinitely; that the tendency to mutate recurs periodically. While we cannot accept the whole of de Vries' theory that all natural species arise in this sudden fashion, there can be little doubt as to the accuracy of his facts, especially as there is confirmative evidence from the experiments of MacDougal.<sup>4</sup> In any case, we must admit his experiments go far to support the view "that the origin of species in Nature is a definite process and takes place by steps of considerable amplitude."

<sup>1</sup> Lock, "Recent Progress in the Study of Heredity and Variation," 1909, p. 116.

<sup>2</sup> Huxley, "Collected Essays," vol. ii., p. 77.

<sup>3</sup> de Vries, "Species and Varieties, their Origin by Mutation," 1905.

<sup>4</sup> MacDougal, various papers published in *Transactions of the Carnegie Institution*, Washington.

With regard to the causes of mutations, little is known other than that nutrition and environment play the greater parts. Of kinds of mutation we can conceive a *progressive* mutation, as when an entirely new character, or set of characters, may make its appearance; this new character may be hidden, or latent, and only make its visible appearance after several generations. de Vries speaks of *degressive* mutation when characters are only partially latent and exhibit themselves suddenly in rare individuals in the form of sports or abnormalities. The reverse may occur, as when a character previously active may become latent; in this case the mutation is said to be *retrogressive*. Again the mutation may be *atavistic*, or throw back to a previous ancestor; this would be a case of ancestral character which had become latent, showing itself once more in an active condition.

Certain obscure points connected with the preceding theory of mutations may appear clearer if we now consider the cognate work of the Abbot Mendel. Originally published in 1866, the works of Gregor Johann Mendel were lost sight of until 1899; since which date their importance has been fully appreciated.<sup>1</sup> The essence of Mendel's discoveries and deductions may be explained by saying that every plant or animal may be regarded as a double structure, having received a series of elements from its male and a series of elements from its female parent. According to Mendel, when dissimilar elements meet in one individual there is, on the formation of the germ-cells, a separation or *segregation* of the two characters which came in. That is to say, the germinal representations of such pairs of characters remain perfectly distinct in the hybrid plant, and separate out at the formation of its gametes in such a way that an equal number of gametes arise containing either character. The members of a pair of characters which behave in this way on crossing are called *allelomorphs*. Further, it may be convenient to explain other terms in common use; the fusion of a pair of gametes during fertilization produces a cell called a *zygote*; if the two gametes are alike the zygote is termed a *homozygote*, while, when the gamete contains opposite members of a pair of *allelomorphs* the result is called a *heterozygote*. Therefore in respect of any pair of *allelomorphic* characters, the individuals are of three kinds only. Assume that the gametes are of two kinds A and a; then the *homozygotes* will be of the forms either AA or aa, and the *heterozygotes* of the

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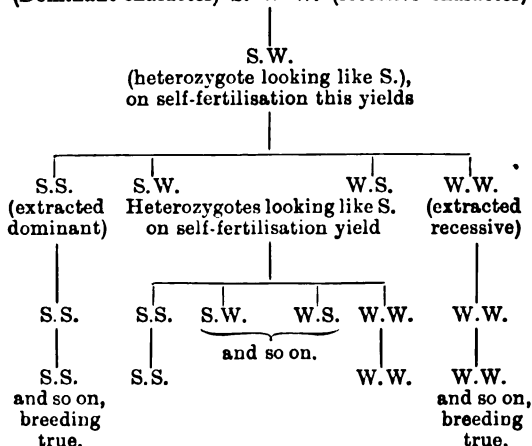
<sup>1</sup> Bateson, Mendel's "Principles of Heredity," 1909. This is a most fascinating book and full of detail concerning this subject.

form Aa. We are now in a position to state the proposition, known as Mendel's law: "The gametes of a heterozygote bear the pure parental allelomorphs completely separated from one another, and the numerical distribution of the separate allelomorphs in the gametes is such that all possible combinations of them are present in approximately equal numbers."

The manner in which characters are actually transmitted has been worked out in the case of many races of animals and plants, and in cases where experimental matings can be carried out and a number of offspring reared it is found that the above rule or law applies and holds good.

It is usual to speak of the respective characters as being either *dominant* or *recessive*, that is, potent or non-potent in respective individuals. Assuming we have a tall man and a tall woman, themselves hybrids or offspring of matings between tall and short individuals, then, in combinations of their male and female germ-cells, it is obvious there will be matings of long male with long female, and short male with short female, while in other cases short female will mate with long male or short male with long female germ-cells. On random selection the result would be that three of the offspring will be tall and one short; this latter reappearing because it contains none of the tall element. Of the tall offspring some will have two doses of the tall factor, others will be cross-bred, having only one dose of it. In this hypothetical case the dominant character will have been tallness, and shortness recessive.

(Dominant character) S. × W. (recessive character)



The following case, given by Lock, may make the subject more clear. In Indian corn there are two common varieties, one with smooth starchy grains and one with wrinkled sugary grains. On crossing these two varieties the grains immediately resulting are smooth and starchy, no matter whether the starch strain is used as the seed-parent or as the pollen-parent. This means that the starchy character is dominant, appearing to the almost complete exclusion in the next generation of the corresponding recessive or sugary character. The further behaviour of this cross is shown in the preceding scheme, where S signifies smooth grain and W indicates wrinkled or sugary. In an actual example 5,310 smooth grains were obtained and 1,764 wrinkled, or roughly, 75 to 25, that is, 3 to 1.

It will be apparent, from the above short account, that the Mendelian theory differs from Weismann's and the biometric school's conception of heredity in so far that it does not admit the assumption that *all* ancestors of the same degree make a substantially equal contribution to the hereditary qualities of the offspring. Its essential doctrine is that the cells of the offspring are of *double* origin, and in them traits and characters derived from both the father and mother can co-exist side by side. Mendel's experiments and others of the same kind show that although every essential character is represented in each germ-cell, yet each Mendelian character is represented by a maternal or paternal determinant only, and not by both. In this way all immediate ancestors are not represented in the germ-cells in respect of any particular character, but only one of the parents is so represented and apparently to the complete exclusion of the other parent. The Mendelian theory is thus considerably simpler than the germ-plasm theory of Weismann, but at the same time its conceptions are strikingly concordant with the results of recent work in cytology. This will be apparent from the following considerations.

In the process of fertilisation, the two conjugating germ-cells as well as the nuclei which they contain become fused together to form a single cell with one nucleus. The separate chromosomes contained in the conjugating nuclei do not fuse, but the paternal and maternal chromosomes remain separate, so that the nucleus of the zygote or new cell contains twice as many chromosomes as does either of the gametes by whose fusion it arose. This indicates that the chromosomes derived from the two parent cells are present in the nuclei of the offspring cell, and reproduce themselves by bi-partition at each nuclear division. In this way each

somatic cell nucleus of the resulting zygotes contains a double set of chromosomes, half being descended from one parent and half from the other parent. Since the gametes contain only half as many chromosomes as the somatic cells, it follows that during the formation of gametes there must occur a reduction in the number of chromosomes to one-half their former number. In the higher animals we know this does occur during the two cell-divisions which lead directly to the formation of the gametes.

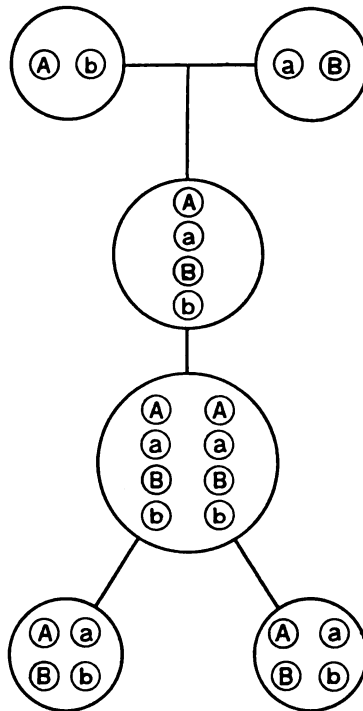


FIG. 1. (After Lock.)

If we consider the case of a cross between parents which differ in respect of two pairs of allelomorphs, and express these pairs as  $A-a$  and  $B-b$ , then the germ-cells of the heterozygote bear in equal numbers the combinations  $AB$ ,  $Ab$ ,  $aB$ , and  $ab$ , in which the symbols  $A$  and  $a$  are the particles representing the allelomorphs of one pair, and  $B$  and  $b$  those of the other. Assuming that one parent shows the characters  $A$  and  $b$ , and the other one those of  $a$  and  $B$ , we can plan the accompanying scheme (fig. 1), which

shows the direct line of development and division of the allelomorphs at each somatic mitosis. When the formation of germ-cells occurs, the members of each pair of allelomorphs must become separated from each other in such a way that the particles originally derived from parents pass over into different cells. This can occur in either of the two ways shown in fig. 2. Experiments have shown that this occurs with equal frequency.<sup>1</sup> The actual vehicles of Mendelian characters are probably not the chromosomes but the minute chromatin granules or *chromameres* which constitute the ultimate structure of the chromosomes. We are indebted to de Vries for this conception, who suggests that when the chroma-

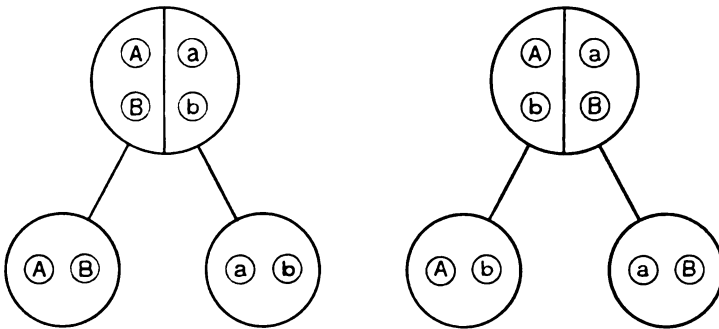


FIG. 2. (After Lock.)

somes fuse together an exchange of allelomorphs takes place between the chromosomes. It follows from this that, in a sufficient number of cases, there follow all possible chance distributions of allelomorphs between the two chromosomes, except that two members of the same pair of allelomorphs would never coexist in the same chromosome. Since the two chromosomes of a pair pass into different germ-cells, that chance distribution is attained which the Mendelian theory requires. One cannot within the limits of this address discuss all the side issues or the more complicated cases which occur; for these reference must be made to the standard literature on this subject, but sufficient has been adduced to show that the Mendelian theory is concordant with recent cytology and throws some light on the minuter features of cell structure.

<sup>1</sup> Lock, *op. cit.*, p. 265.



The application of the Mendelian theory of heredity has been made to a considerable number of diseased or abnormal states in man. Its simplest application is in the elucidation of eye-colour descent. The colour of eyes may vary from the very dark to the light or blue. The distinction turns on whether there is pigment or not on the front of the iris. The ordinary blue eye has no front pigment, while in the brown or dark eye there is pigment in front. The presence of pigment is a dominant factor, it may be much or little; and when it is present it may be transmitted, but when there

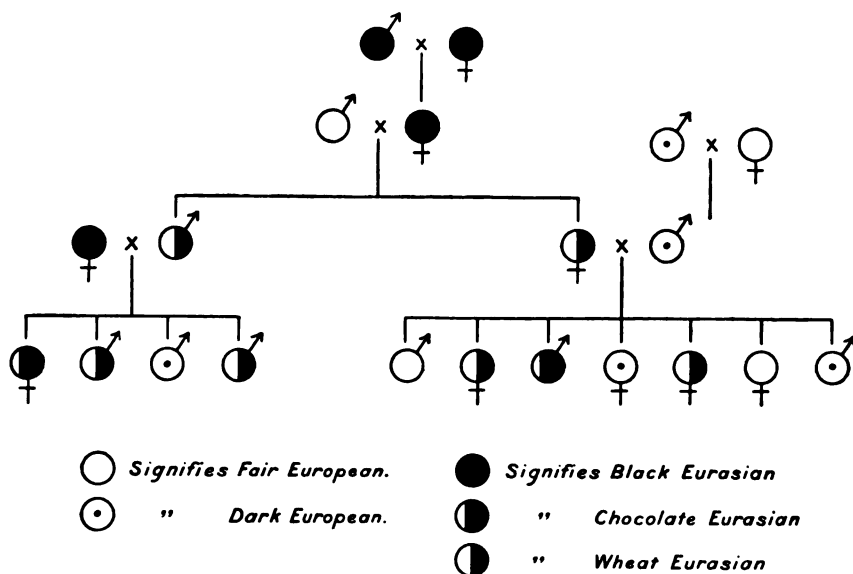


FIG. 3.

is none in the parent's eyes the children have none of it. It follows, therefore, from the Mendelian standpoint, that blue eyes, once they separated out, should breed true; also that the recessive blue character mated to the blue breeds true. So, too, in the dark-eyed type, when a dark-eyed person with the blue factor recessive mates with a blue-eyed person, there will be an equal number of dark- and blue-eyed offspring. If a pure dark-eyed person, that is, one without any recessive blue-eye factor in him, mates with a blue-eyed partner, then all the offspring may be expected to be dark-eyed. If we take two dark-eyed parents, the dark element being dominant, three kinds of mating are possible—thus D.D. with D.D., D.D. with

D.B., and D.B. with D.B. In these cases D. is the dominant dark-eyed and B. is the recessive blue-eyed character. So far as visible characters are concerned two results in the offspring are possible; either all the children will be dark-eyed, or some will be dark-eyed and some blue-eyed, the former in the greater number, probably in ratio of 3 to 1.

As bearing upon this question of inherited pigmentary features, I call your attention to the accompanying family tree (fig. 3). It represents the results of crossing between the European and native, and was personally investigated by me in India some years ago before I had any idea of Mendel's work. It commences with the marriage of a fair-haired and blue-eyed Yorkshire man with a pure-blooded Punjabi woman. The two children were Eurasians. The son married a native woman and the offspring were all of the native type, except one who is on the dark side. The daughter married a dark European with light or fair character recessive. The offspring of this union are strikingly concordant with Mendelian principles, for of the seven children two are of the typical fair type. I do not attach any great importance to this particular pedigree, as it is like many others which have been traced, but I introduce it here as suitably illustrative of Mendel's doctrine of segregation and gametic purity. At the same time I am bound to say that the value of observations of this kind has been seriously challenged, notably by Karl Pearson and those who would judge facts of this nature from a purely statistical standpoint. To my own mind the most serious objection lies in the unavoidable dependence upon personal opinion as to colour or shades of pigmentation in the individuals under review.

One has not time to refer to other pedigrees bearing upon such diverse characters as congenital asthma, keratosis, coat-colour in horses, ptosis, coloboma, squint, brachydactylism, &c. You will find many of them in the literature on this subject. For most of them the rule holds good that transmission is through the affected person, that is, they follow the Mendelian dominant, individuals not possessing the special factors being unable to transmit them. Conversely, you can get pedigrees showing the influence of a recessive character—albinism, for instance, and alkaptonuria. Difficulties are presented by sex-limited heredities, such as colour-blindness, hæmophilia, and pseudo-hypertrophic paralysis, but the difficulties are probably more apparent than real when looked at from the Mendelian standpoint. Take the case of horned and hornless sheep. If a cross be made between

the Dorset Horned, which have horns in both sexes, and the Suffolks, which are without horns in either rams or ewes, the first generation of male lambs have horns, but the ewes have not. Here this horned character may be said to be dominant in males, but recessive in females. The second generation bred from the first shows four types, horned and hornless males with horned and hornless females. If the generations be carried further the horned ewes of the second generation are found to be pure for horns, and the hornless rams of the same generation are pure for the absence of horns. From this it is apparent that for the female to be horned she must be homozygous in that character, in other words, the factor for hornedness must come in from both parents. Conversely, for the male to be hornless, he must receive the deficiency from both sides of his parentage. As Bateson<sup>1</sup> puts it, this matter of certain characters following certain sexes would appear to be merely a question of dosage.

The facts are similar in the case of man. Thus, in colour-blindness the female appears not to be colour-blind unless she receives two doses of the colour-blind factor, in other words, she must be pure in colour-blindness in order to exhibit it. But the male may be colour-blind if he has but one dose of it. The woman with one dose, though she does not show it, may transmit it to her offspring. We can, therefore, say colour-blindness is dominant in males, but recessive in females, and that a colour-blind female must have had a colour-blind father, and all her sons will be colour-blind. *Per contra*, the normal male has no colour-blind factor, and unless his wife introduces the peculiarity will have normal children. The male who is not colour-blind cannot pass it on, no matter what his ancestry, and even the male who is colour-blind appears rarely to transmit the affection. Although there are authentic instances of the direct descent of colour-blindness from father to son, it is known that in all of them the affection was introduced by the normal-sighted mother also. Colour-blindness is probably due to the presence of a something conducing to colour-sense paralysis.

In the case of some of the other sex-limited heredities there are difficulties still unexplained, notably in hæmophilia and in pseudo-hypertrophic paralysis. The data concerning these diseases, available for analysis, are somewhat heterogeneous, but in respect of the other examples quoted we are on safer ground; so much so that we may assume that sex itself acts as a specific interference, stopping

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<sup>1</sup> Bateson, *op. cit.*, p. 170.

or inhibiting the effects of a dominant factor. It is curious to note that the inhibition occurs in the female and not in the male, but the inhibition would seem to be limited to cases where the character is heterozygous (single dose) and absent when the character is homozygous (double dose). On the view that femaleness itself is the suppressing factor in the case of some of the pathological states, it is suggestive to recall the circumstance that old or impotent females among the higher animals sometimes assume some of the secondary characters of the male. Can it be that the male character was present in their constitution as a previously latent factor? Doubtless, to some of you, it may have occurred, have these questions thrown any light on the baffling mystery of sex determination? Yes, they have, but only partially so. I can make no pretence to discuss the facts, but would say this, that all Mendelian experiment points to the idea that sex determination is really a matter of gametic differentiation, and the fact that in ordinary cases the two sexes are produced in equal numbers indicates that one sex is heterozygous in respect of sex character, and the other homozygous. In the case of the human family, there is much to suggest that the female is heterozygous for the female factor, whilst the male is homozygous recessive.<sup>1</sup>

Without prejudice as to certain controversial points, I think we can say that recent work, notably that on Mendelian principles, has done much to place the problem of heredity and variation of species upon a better basis, and to render clearer what was formerly very obscure. Of course there is much more to be done. Further, I think you will agree that a *prima facie* case has been made out for the plea that the hereditary factor can be traced on a scientific basis in regard to simple pathological states. But, you will say, what about the more complex diseases of everyday life? Can we apply any suggested theory of heredity to them? Certainly we can, but in so doing we must have accurate facts, and also bear in mind that in these diseased conditions we are but contemplating variations. In this contemplation of variations, we must be careful not to limit them to mere changes of form, structure, or colour; we must recognise there can be changes or variation in function. Think what a vista of diseased or abnormal conditions this brings up. We are all familiar with the connection which appears to exist between thyroid disease and myxœdema, also between an abnormal condition

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<sup>1</sup> For an elaborate analysis of this question, the reader should consult Bateson, *op. cit.*, p. 190.

of the pituitary body and acromegaly. So, too, we know of other diseases arising from disordered metabolism within the body, or due to toxins, enzymes, and ferments present in the tissues. Not a few of these, such as gout, cystinuria, alkaptonuria, tuberculosis, insanity and cancer, appear to run in families, and the practical question is how far can these diseases be ascribed to heredity, or are they acquired through forces acting on the individual affected.

Before we can appreciate the true part which heredity plays in any of these affections, we must have accurate facts as to the individuals of two, three, or more generations. Much of the evidence as to ancestral disease is mere hearsay, and consequently unreliable. We want accurate family medical histories, in which every statement made is verified personally, if possible, by the technical observer. It need scarcely be remarked that when a disease, such as tuberculosis, affects certain families with special frequency, the hereditary factor is either the presence of something which renders the individual specially liable, or the absence of something which confers a degree of resistance. From the nature of the case a bare pedigree will not be of value, unless it be amplified by details as to what were the relative risks of infection borne respectively by those who develop the disease and those who escape. Varieties in several degrees resistant to disease are known in many orders of plants, and there are indications of a similar character in animals and man. An attractive field of research is here open, and it is legitimate to believe that various types of resistance will be disclosed, some dominant and some recessive. If each medical man would construct but one such medical pedigree in respect of some disease in one family, we should have in twenty years all the scientific material needed to answer these questions as to the inheritance of deformity, colour, and constitutional tendency to special diseases. We need to divorce facts from fancies, and only record definite facts, leaving others to put their interpretations on them. The material is not available for us in our day to learn or know the truth, but our work in this field, if we will but do our share, will make much clear for those who are to follow.

I fear I have allowed myself to be too discursive, and possibly been none too intelligible. If so, I hope you will make allowances on account of the inherent difficulties of the subject. I have tried to take you over ground which is somewhat out of the beaten path, and I only hope I may have stimulated your interest sufficiently to tempt you to make incursions on your own account into the same field of scientific enquiry and observation.

## ON THE CAUSE OF RELAPSE IN MALARIA.

BY MAJOR W. S. HARRISON.

*Royal Army Medical Corps.*

THE question of the actual cause of relapse in malaria after a long interval has been much discussed, but, so far, there is no general agreement as to the processes involved. We know by practical experience that, as a rule, when quinine is administered in adequate doses the vast majority of the parasites disappear from the peripheral blood, so that after one or two doses it is usually impossible to find them, even after the most careful search. The only exception to this rule that is generally recognized clinically is the extreme persistence of crescents, and more especially female crescents, in the finger blood even after considerable doses of quinine have been given by the mouth. Schaudinn pointed out that in an ordinary case of benign tertian infection the asexual forms disappeared very soon, and were followed in a few days by the male gametes, leaving the female gametes alone. This is in accordance with general experience, for it is a common thing to come across a slide showing practically nothing but female gametes. Having arrived at this point, it becomes difficult to understand how the parasite could carry on its existence unless something happened to the female gametes to give the generation a new lease of life. Schaudinn<sup>1</sup> has described such an occurrence in the form of a process of parthenogenesis, whereby there was formed from the female gametes a new set of asexual forms capable of multiplying in the human host by a simple process of division. The patient from whom he obtained his specimens was one who always got a relapse of fever when moved from one town to another. He was so moved for experimental purposes, and specimens of the blood were taken at frequent intervals. It was found that the changes which went on in the female gametes were as follows: The nuclear chromatin split up into two portions, one rich in chromatin and staining darkly, and the other poor in chromatin and staining lightly. The body of the parasite then became partly constricted into two halves, each containing one of the masses of nuclear chromatin, the one containing the lighter staining mass having a darker staining cytoplasm and holding the most of the pigment, the other surrounding the darker mass of nuclear material having a much lighter staining protoplasm and much less of the pigment. The first, the one containing the lighter staining nucleus, eventually degenerated and disappeared,

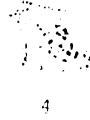
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<sup>1</sup> *Arbeiten a. d. kaiserl. Gesundheitsamte*, vol. xix., part 2, p. 169.

while the nucleus of the other underwent a process of division, the result of which was that in the end a "rosette" was formed. The merozoites from this rosette largely developed, like their parent, into gametes, and one might have, even in the second generation, a repetition of the process of parthenogenesis. From time to time other workers have seen portions, at any rate, of the cycle described by Schaudinn, and some time ago Sir William Leishman showed a specimen before the Pathological Society of London which seemed to illustrate the last stage of the process, while quite recently Anschütz<sup>1</sup> has described an almost identical cycle occurring in the spleen of paddy birds (*Spermestes orizivora*) infected with a hæmoproteus (*Hæmoproteus orizivora*).

Specimens, however, which illustrate only the last stages of the process are unconvincing, as they might just as well be interpreted as due to a simultaneous infection of a red cell by a gamete and a schizont; and, as a matter of fact, it is difficult for an unprejudiced observer to make out any substantial difference between the figures given by Schaudinn to represent the effect of such a double infection and those given to illustrate the last stage of the formation of the gametoschizont. With the earlier stages of the process this difficulty does not arise, and when one is able to follow in a specimen the different steps from the first division of the nucleus of the gamete to the final production of the so-called gametoschizont, the interpretation of this last seems easier. Quite recently I have had the good fortune to come across specimens from two cases of benign tertian infection which seemed to give examples of all the stages of the process as Schaudinn described it. The first specimen (the one illustrated) was taken from a case of relapsing malaria. In it one is able to trace the splitting of the nucleus into a lighter and a darker portion (fig. 1), the separation of the latter (figs. 2 and 3), and its splitting up into fragments which are eventually destined to become the nuclei of the merozoites (figs. 4 to 14). I was not, however, able to satisfy myself of the occurrence of a partial constriction of the parasite such as Schaudinn described, nor was I able to make out any differentiation in the distribution of the pigment in the different parts of the organism, unless one takes fig. 5 as an example of constriction of the body of the parasite; on the other hand, several of my figures rather point to the extrusion of the residual chromatin. In figs. 7 to 9 this process seems to be well on its way, and in fig. 13 there seems to be a definite separation between the pale-staining residual chromatin

<sup>1</sup> *Cent. für Bakt. Originale*, vol. li., October 9, 1909, p. 654.



Slide 4 (Lipovitch, 1910)

# PARTHENOGENESIS OF PLASMODIUM VIVAX (CASE 1)





and the rest of the parasite. I may remark, *en passant*, that the whole of my sketches were made before I had seen Schaudinn's original illustrations, although, of course, I was familiar with his description of the process. When one studies the two sketches which Schaudinn gives to illustrate the partial division of the whole parasite and the different colour reactions of the two halves, it seems just as likely that his drawing showing constriction of the parasite was taken from a specimen where the protoplasm was dragged out by mechanical means. I thought at one time that I was seeing the same thing, until I realised that figures of that sort were only found at the extreme edge of the slide; they often occurred in that situation in red cells of apparently normal shape. I have already remarked that it is almost impossible to make out any difference in the figures given by Schaudinn to illustrate the double infection of a red cell and that given to show the difference in the depth of colour of the two halves into which he believed the parasite to divide. My second specimen, which is also probably from a case of relapsing malaria, illustrates the same changes as the one which I have just described, but there are not so many of the forms to be found; sufficient, however, to serve to confirm the observations on the first specimen. One naturally turns to one's old slides to see how far they illustrate similar conditions, and in doing this I have been struck with the frequency with which gametes preponderate in specimens taken in this country, and which one can safely assume are from relapsing cases. Now and again among these one comes across a gamete the nucleus of which is dividing or has divided into a lighter and a darker mass; and on one former occasion I came across a form which I took to be a gametischizont, but which might just as well have been an example of double infection of a red cell by sexual and asexual elements. The objection arises that if this parthenogenesis is the cause of relapse in malaria, it should be more frequently seen; but perhaps it is only accidentally that the gametischizonts appear in the peripheral blood, and possibly the normal place for their production is in the deeper organs, like the spleen. One remembers that Craig<sup>1</sup> has shown that the whole of a latent infection may go on in the spleen without any parasites being found in the peripheral blood, or any suspicion of malaria arising in the clinician's mind.

If that were so, it would be easy to understand how it is that gametischizogony is not often seen, since the process would be going on quietly and producing no symptoms till there was a sufficient number of parasites to set up a paroxysm of fever.

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<sup>1</sup> Osler and McCrae, "System of Medicine," vol. i., p. 413.

## NOTES ON MILITARY MAP READING.

BY MAJOR A. P. BLENKINSOP.

*Royal Army Medical Corps.**(Continued from p. 565.)*

## CONVENTIONAL SIGNS AND LETTERING.

BEFORE proceeding further with the study of map-reading, the student should thoroughly acquaint himself with the various conventional signs employed in maps and field sketches. It is not considered necessary to reproduce them here, as the more important of them are shown in the margins of most Ordnance and manœuvre maps, and everyone who takes up the subject of map-reading should obtain a map of some district which is easily accessible to him, so as to be in a position to supplement theoretical study by practical application. A sheet of the 1-inch Ordnance map will be found to be convenient for this purpose. The conventional signs and lettering used in field sketching are fully illustrated in Plate 9 of the "Field Service Pocket Book."

*Woods.*—It will be noticed in an Ordnance map that deciduous and coniferous trees are represented by miniature drawings of either class of tree. A fir-wood has consequently a more "spikey" appearance than one composed of other trees. Woods should generally be taken to be impassable for wheeled traffic if no definite tracks are shown through them. Fir-woods nearly always have tracks, and it is usually possible to get vehicles through them if care is exercised. In coloured maps, woods are tinted green.

*Park Land.*—Areas on the map representing park land are stippled, and consequently look darker than the surrounding country or than woods. Parks usually make excellent camping grounds, and in most cases are attached to commodious houses, which, if available, would be eminently suitable for the headquarters of a force, or for adaptation to the requirements of a large stationary hospital.

*Orchards* can be distinguished by the miniature drawings of deciduous trees being arranged in parallel rows at regular intervals.

*Roads.*—There are four classes of roads figured on Ordnance maps and their conventional representations should be carefully studied.

(1) *First-class Roads.*—Main roads from town to town, which have 14 feet or upwards of metalling. They have no gradient over

1 in 30, and afford space throughout their length for a double line of wagons, one line passing the other. Represented by two parallel thick lines.

(2) *Second-class Roads*.—Country roads from town to town, or village to village. Have under 14 feet of metalling; in good repair. These are usually excellent roads and suitable for any kind of traffic. Represented by two parallel lines, one thick and the other thin.

(3) *Third-class Roads*.—Country roads. Under 14 feet of metalling; in bad repair. Represented by two parallel fine lines.

(4) *Fourth-class Roads*.—Unmetalled cart tracks. Represented by two parallel fine lines, so close together as to appear, at first sight, almost like a single line.

In coloured Ordnance maps first and second class roads are tinted brown.

Where roads are unfenced, that is to say, where they are bounded by no obstacle which would prevent wheeled traffic from being turned off them, they are represented as being enclosed by dotted, not continuous, lines.

For cavalry marching in files (two abreast), wagons in single line, or infantry in four, the minimum width of roadway necessary is 10 feet.

*Footpaths* are represented by single fine broken lines. County boundaries are shown in the same way, but lines are thicker and more distinct.

*Railways*.—The conventional representation of railways should be observed, and the methods of showing whether there are two or more lines should be distinguished. The signs employed to indicate bridges, level crossings, cuttings, embankments, tunnels, and viaducts, should also be noted.

*Streams, rivers, and canals*, if under 15 feet in width, are shown in Ordnance maps as a single line. Wider streams are shown as double lines with shading between.

The representation of bridges, fords and ferries is shown in the diagram.

*Ford*.—The following depths are fordable :—

For infantry, 3 feet.

For cavalry, 4 feet.

Wagons containing ammunition, 2 feet 4 inches.

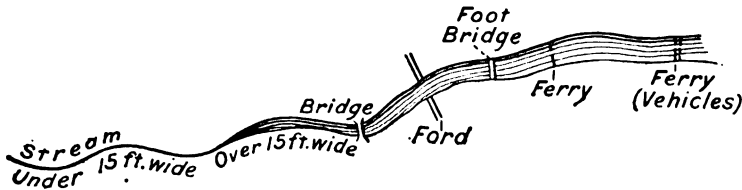
“Gravelly bottoms are best, sandy bottoms are bad, as the sand gets stirred up and the depth of the water thus increases.”

“Fords should be clearly marked by long pickets driven into the river-bed above and below the ford, their heads being connected by

a strong rope. It is as well to mark the pickets in order that any rise of the water may be at once evident."

"The depth of the river is generally most uniform in straight parts; at bends the depth will generally be greater at the concave bank and less at the convex."

"For this reason a river which is not anywhere fordable straight across may be found passable in a slanting direction between two bends; other means of passing a gap are flying bridges and ferries." ("Field Service Pocket Book," p. 124.)



"Bridges for wheeled military traffic should have a width of 8 feet in the clear at least. The normal width is 9 feet."

"A bridge which will carry infantry in fours crowded at a check will carry most of the ordinary wagons that accompany an army in the field."

*Other Conventional Signs.*—The conventional signs used to represent a church with a tower, a church with a steeple, a church without a tower or a steeple, a windmill and a wind-pump should be carefully observed. These are usually prominent objects in a landscape, and of great assistance in setting a map, or determining one's position, as will be more fully explained later.

Roman antiquities are indicated by names printed in block letters; British and Celtic antiquities by early English type.

(To be continued.)



## United Services Medical Society.

SESSION 1909-10.

### ADDRESS BY THE PRESIDENT.

SURGEON-GENERAL A. M. BRANFOOT, C.I.E., M.B.

*Indian Medical Service.*

IN addressing you this evening I desire in the first place to express my great appreciation of the honour of being your President during the Society's Session for the year which commences to-day. The Society has now reached its third year of life and may be said to have emerged from its infancy to a period of adolescence, if not full maturity. The strength of the members has been well maintained, the numbers at present being :—

Navy	..	..	..	..	187
Army	..	..	..	..	242
Indian Medical Service..	..	..	..	..	28
Territorial	..	..	..	..	12
Total	..	..	..	..	469

and the general average attendance at the meetings about 80.

It is unfortunately inevitable that the number of members available for attendance at meetings in the case of such a Society as ours must always be comparatively small in consequence of the absence at sea or abroad of such a large percentage. Many of the absent members must, however, be placed under favourable circumstances for contributing papers on subjects in which they take special interest or have experience which may be read at our meetings. I think it is much to be wished that such contributions should be made more often than at present. They would, I am confident, be welcomed, and even if they are not on original subjects would add to the knowledge we already have in many matters which require light and fresh facts before they can be fully understood. The field of work open to our Society is large compared with that which engages the attention of others in this country, in many of which the members are confined to subjects of a special nature. When the objective of this Society is considered it will be found that there are few branches of medicine and surgery in which it may not interest itself or which are closed to it for discussion. It may, I think, be useful to look back over our two years of life and consider for a few moments how far the efforts already made have met with success.

I find that many valuable papers, covering quite a large range of subjects, have been read and have been followed by useful, though perhaps not exhaustive discussions. In such it would seem to be very desirable that we should have further information giving the results of more recent work and riper experience leading to further fruitful discussion. Among these papers may be included the important and valuable paper by Dr. Pembrey on the "Physiological Principles of Physical Training," read before the Society in February, 1908. The physiologists' side of the question was so ably and strongly placed before the meeting that what may be called the anatomical side of the case would not appear to have received full value. The subject is one of much importance to the Services as well as for the individual, especially to any who desire guidance on the best methods of maintaining a healthy body and mind, either in ordinary life in this country or during residence in the Tropics, by the use of bodily exercises in all forms.

Also in 1908 a paper entitled "A Plea for a More Detailed Study of the Soldier's Heart," by Lieutenant-Colonel Deane, opened an interesting and important subject which might be well enlarged upon and discussed. The subject touches very closely the duties of Service officers, and it would be instructive to have more information, especially from the clinical rather than the purely physiological point of view, or from that afforded by statistics. In July, 1908, another interesting paper was read by Lieutenant-Colonel Macpherson, entitled "Some Practical Points in the Prevention of Disease in Panama and Cuba." I do not think any more valuable paper on this subject has ever come to my notice; it may be taken as a basis for combating malarial diseases in all parts of the world. Colonel Macpherson has shown in the clearest way possible how measures taken against malarial disease should, to be effective, combine the methods of practical hygiene with measures taken for mosquito destruction, and the methodical use of quinine, and how useless the one is without the other. He also demonstrates how expenditure of money given in what may appear to be a lavish manner may become a good investment for a Government—a thing which is too often not recognised. Another paper of a more clinical nature was read in October, 1908, on "The Micro-organisms of Dysentery," by Major Blackham. The relation of these organisms to dysentery, the various forms of colitis, hepatic abscess, gastro-duodenal affections, and other affections of the liver and the pancreas, on all of which much work is now being done, is a matter of much interest and practical importance. It is very desirable that the

clinical side of the work in these affections should go hand in hand with that which is more strictly scientific, so that we may be able to differentiate more clearly between the character and causation of a number of them, intestinal affections especially, of which the nomenclature is at present somewhat confused. Such investigation will also aid in the formation of a clear diagnosis and open the road to treatment on sound lines.

During the years 1908 and 1909 two meetings have been given up to Clinical and Pathological Demonstrations. I regret that I was not able to be present at either of these meetings, for I conceive that such are not only of great interest but of much importance to all members. I hope that some more of such meetings may be held during the present year and that, if possible, their scope may be enlarged by the formation of small committees to consider in greater detail cases and specimens about the nature of which there may be doubt; such committees could report upon the cases or specimens at a subsequent meeting. This practice would, I think, further useful discussion and be of some practical value.

There is one other affection which has not so far come under discussion at any meeting; but on account of its importance to the Services will, I venture to hope, receive notice before long. This is that hydra-headed condition known as neurasthenia. As a cause of ill-health and consequent inefficiency this disease is one very commonly met with in all the Services, and perhaps it is from this so common occurrence that it has not received the attention which my experience leads me to think it deserves. Time will not permit of my doing more than touch upon the subject. The term "neurasthenia" is much used in invaliding medical cases, usually not in a sufficiently exact way to denote general breakdown in health. It often replaces in nomenclature the term "debility," which was formerly much used to cover a multiplicity of unconsidered or only partly considered conditions and was naturally much objected to officially.

This lumping together of a number of conditions, each of which is deserving of investigation and consideration, is, no doubt, a convenient way of disposing of a medical case, but it is unscientific and harmful, in that it leads to the real malady being often overlooked and an entirely wrong line of management or treatment being followed. This naturally acts disastrously to the individual and is not to the best interests of the Service to which the sufferer may belong. I would suggest that the clinical investigation and



sifting of such cases is very worthy of attention and study. As at present used the word "neurasthenia" may cover "insanity," "mental affections," spinal strain or disease, cardiac and vasomotor troubles, gastro-intestinal conditions, sexual conditions or traumatic consequences and other affections, some of which may have only a functional origin, but many if properly traced will be found due to organic changes. It is not to be wondered at, therefore, that the individual is often incorrectly treated and does not get well as quickly as he should do, or that the Service wrongly retains or wrongly gets rid of men who might have been more justly dealt with. From another point of view, the neurotic element which so often is the cause of mental neurasthenia, especially when the individual comes under unfavourable circumstances of employment or climate, is of considerable importance in recruiting or in the acceptance of candidates for an employment which requires the possession of a sound nervous system.

In reference to this subject, I hope it may not be considered out of place if I say a few words on clinical study generally. I should like to ask if there is not in these days, in which advanced scientific work occupies so much time, some danger of neglecting the interests of the "individual." It is impossible for all to do research work on a large scale, however attractive and however useful such may be. The care of the "individual" must remain the chief work of the majority. The Clinical Society of London still flourishes, and in the cause of humanity it is to be hoped that it will always continue to do so. The primary object of that Society is the "record," "investigation," and "discussion" of individual cases; its aim has always been to make bedside observation of cases as accurate, complete and useful as possible, as opposed to academic discourses on general topics. It has been well said by a distinguished medical physiologist in this country that "clinical facts are as certain as anything in biology and have remained certain for centuries, while the explanation of them has changed with the successive changes in physiology." I am certain that we, as physicians, are not yet and never will be able to dispense with those aids to correct understanding of individual cases and the formation of accurate diagnosis leading to just consideration of prognosis and successful treatment, which we have in the use of our own senses, in particular those of sight, touch, and hearing. The stethoscope is not by any means an aid which can be dispensed with, or an instrument to be locked up in a museum, nor can we do without the other well-worn aids in clinical work. Probably we

are all in agreement about this, but there is the temptation nowadays to resort to the more attractive and mechanical methods of investigation which in most instances should follow rather than precede exhaustive bedside examination. To give way to such temptation is to court mistakes which the use of observation and our own senses would avoid. One often hears that in the present day delicacy of touch and hearing and the training of the senses is inferior to what was possessed by the physicians of two generations ago; this may or may not be true, but there is no reason why it should be, and it will be a deplorable thing if it should occur. In making a plea in favour of clinical work I hope I may not be considered to undervalue in any way the work of scientific investigation leading to the prevention of disease, in which so many of the officers of our medical services are engaged; work that is now being carried forward with such marked success in this College, within whose walls we are privileged to hold our meetings. Gentlemen, in making these few remarks my desire has been to confine myself to matters connected with the Society whose welfare we all have at heart, a wish I cannot express better than in saying, "Let it advance and prosper!"

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#### TOTAL ENUCLEATION OF THE ENLARGED PROSTATE PRACTICAL OBSERVATIONS ON THE OPERATION.<sup>1</sup>

BY LIEUTENANT-COLONEL P. J. FREYER, I.M.S. (RETIRED PAY).

*Surgeon to St. Peter's Hospital; Consulting Surgeon to Queen Alexandra  
Military Hospital.*

I HAVE in the first place to acknowledge the compliment you have paid me in inviting me to contribute a paper to the proceedings of the Society at this the opening meeting of the Session; and I hope I may be permitted to express the pleasure it gives me to be enabled to comply with this invitation under the Presidency of a friend and valued officer of my old Service.

No apology is, I trust, needed for choosing for my theme the operation of enucleation of the enlarged prostate. It is true that the condition requiring this operation is not one frequently encountered in naval and military surgery, for the simple reason

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<sup>1</sup> Paper read at the United Services Medical Society, October 13th, 1909.

that the malady is mainly confined to the declining years of life. Still I possess among my trophies the prostates removed from many old sailors and soldiers drawn from institutions under the control of the medical officers in the Services, as well as of many officers on the active and retired lists. Amongst these latter the senior officers of the Services from which the members of this Society are drawn, figure largely—a fact which will appeal to you personally no doubt, as opening up a not unpleasant contemplation of the future, I hope!

But to whatever extent you may be brought into contact with this malady, as officers in the Services you will be desirous of being *au courant* with the most recent advances in surgery, and I believe I may say there is no surgical innovation that in recent years has aroused greater interest in the profession all the world over than that with which we are dealing this evening.

I am afraid that in what I am going to say to you to-night there is little new—little that I have not already published; but I hope that with the aid of a few rough drawings on the blackboard I may be enabled to make clear to you a subject that in written description is not quite easy to comprehend. A brief description of the anatomical and pathological considerations, on which my operation is based, is necessary for a clear comprehension of the details of the procedure.

Examination of the specimens removed in these operations has thrown an entirely new light on the anatomy of the prostate, and its relations to the surrounding structures, and proves that the descriptions contained in the anatomical text-books generally were incomplete, and erroneous in treating that organ as a single body with a canal tunnelled through it in the form of the prostatic urethra.

The prostate is in reality composed of twin organs, which in some of the lower animals remain distinct and separate throughout life, as they exist in the human male during the first four months of foetal existence. About that period in the human foetus they approach each other, and their inner aspects become agglutinated together, except along the course of the urethra, which they encircle in their embrace. These two glandular organs, which constitute the lateral lobes of the prostate, though welded together, as it were, to form one mass, remain, so far as their secreting functions are concerned, distinct, their respective gland-ducts opening into the urethra on either side of the verumontanum. Each of these two glandular bodies, or prostates, is enveloped

by a strong fibro-muscular capsule; and it is these capsules—less those portions of them that dip inwards, covering the opposing aspects of the glandular bodies or lobes, and thus disappearing from view, being embedded in the substance of the prostatic mass—that constitute the *true capsule* of the prostate regarded as a whole. This capsule extends over the entire organ except along the anterior and posterior commissures, or bridges of tissue that unite the lateral lobes in front of and behind the urethra, thus filling in the gaps between them. This capsule is intimately connected with—in fact forms part of—the prostatic mass, and is incapable of being removed from it even by dissection.

The urethra, accompanied by its surrounding structures—viz., its longitudinal and circular coats of muscles continued downwards from the bladder, its vessels and nerves, passes downwards and forwards between, and is embraced by the inner aspects of the two glands or lobes.

The ejaculatory ducts enter the prostatic mass close together in an interlobular depression at the upper part of its posterior aspect, each duct coursing along the inner aspect of the corresponding lobe. They do not penetrate the capsules of the lobes, but pass forwards in the interlobular tissue to open into the urethra.

The prostate thus constituted and enveloped by its true capsule is further encased in a second capsule, or *sheath*, formed mainly by the recto-vesical fascia. Embedded in this sheath lies the prostatic plexus of veins, most marked in front and on the sides of the prostate.

There is nothing that illustrates more simply and forcibly the composition of the prostate and its coverings than an orange. If we imagine the edible portion of an orange composed of two segments only, instead of several, with the septum between them placed vertically, we have a rough and homely illustration of the formation of the prostate. The strong fibrous tissue which covers the segments of an orange, and which is intimately connected with the pulp, represents the true capsule of the prostate, the two segments or halves of the orange representing its two lobes. Further, the rind represents the sheath formed by the recto-vesical fascia.

And here let me remark that in the operation about to be described, it is this inner or true capsule that is removed, the outer capsule, or sheath, containing the prostatic plexus of veins, being left behind, thus preventing infiltration of urine into the cellular tissues of the pelvis. The old text-books drew no

distinction between the two separate coverings of the prostate, treating them both combined, or the outer one only, as "the capsule." To persons brought up in this school of thought and teaching my operation must necessarily at first sight have appeared impossible.

In most, if not all, cases of enlargement of the prostate of declining life (cancer being excluded) the overgrowth is adenomatous; numerous encapsuled adenomatous tumours being found embedded in the substance of the lobes, and frequently protruding on their surfaces. They sometimes assume the form of polypoid outgrowths, which, however, are invariably enclosed within the true capsule, which is pushed before them. As the lobes enlarge they bulge out and have a tendency to become more defined and isolated, thus recalling their separate existence in early foetal life. They become more loosely attached along their commissures (particularly the anterior one), and in the course of this change the urethra, with its accompanying structures, is loosened from its close attachment to the inner surfaces of the lobes, particularly below the verumontanum, thus facilitating its being detached and in large part left behind in the removal of the prostate, as will presently appear.

In the earlier stages of the adenomatous overgrowth the enlargement is probably mainly extra-vesical. Its expansion in this direction is, however, limited, particularly by the triangular ligament below. As the enlargement progresses it advances in the direction of least resistance—namely, upwards into the bladder. The sheath at the upper aspect of the prostate is incomplete, and the prostate insinuates itself through this opening into the bladder, and, the inner layer of the bladder muscle becoming thinner and thinner from pressure of the outgrowth, the prostate in this direction is eventually covered only by mucous membrane.

In most of the specimens of enlarged prostate removed by me a well-defined circular groove is noticeable at the junction of the intra- and extra-vesical portions. This groove is caused by the constriction of the growth by the sharply defined edges of the sheath and by the sphincter muscle.

The shape of the outgrowth in the bladder appears to be mainly influenced by the conformation of the sheath superiorly, and by the two strong muscular bands found in the inner layer of the bladder muscle which are continued downwards from the ureters and, converging, pass into the floor of the urethra. Sometimes this outgrowth assumes the form commonly known as a middle

lobe, which, as can be seen from the specimens, is not a middle lobe at all—there being no such structure in the normal prostate, as pointed out by Sir Henry Thompson nearly fifty years ago—but an outgrowth from one or both of the lateral lobes. More frequently there is a protrusion of each lateral lobe into the bladder, and this may advance to such an extent that one-half, or even more, of the bulk of the enlarged prostate may lie in this viscus. These, then, are the anatomical and pathological considerations on which my operation is based.

*The Operation.*—The pubes having been previously shaved and the parts purified, an anæsthetic is administered and suprapubic cystotomy performed. The bladder is thoroughly washed out with an antiseptic lotion in the first instance, the catheter used for this purpose being made of stiff gum-elastic and of the largest size that the urethra will readily admit. The bladder is then distended with lotion and the catheter left *in situ*. An incision varying in length from  $2\frac{1}{2}$  to  $3\frac{1}{2}$  inches, according to the stoutness of the patient and the previously estimated size of the prostate, is made in the median line of the abdomen, its lower end reaching to the level of the pubic arch. This incision is rapidly carried down through or between the recti muscles till the prevesical space is opened. Any bleeding vessels being clamped by catch forceps, the forefinger is introduced into the lower angle of the wound and the prevesical fat scraped upwards off the bladder by the finger-nail for the whole length of the wound. The peritoneum, which should not be seen, is thus pushed upwards out of harm's way, and the bladder appears deeply in the wound, quite tense, glistening, and of a pale white colour, with large and tortuous veins coursing in its substance. Selecting an area devoid of veins, the point of the scalpel is plunged boldly into the bladder and an incision about an inch long is made in the vertical direction towards the symphysis. The wound in the bladder can be enlarged subsequently if necessary; and this is best effected—as being attended by least bleeding—by separating two fingers placed in the wound and tearing the bladder wall to the required extent. On withdrawal of the scalpel the forefinger is introduced into the bladder as the lotion rushes out through the wound, and a general survey of the viscus is made. Should calculi be present they are forthwith removed by forceps or scoop.

The forefinger of the other hand is now introduced into the rectum, to render the prostate prominent in the bladder and to keep it fixed during the manipulation by the finger in the bladder. The mucous membrane over the most prominent portion of one

lateral lobe (or over the so-called "middle" lobe if there be but one prominence) is scored through by the finger-nail and gradually detached by it from the lobe. The other lobe is similarly attacked and laid bare of mucous membrane.

As I have already explained, the portion of the enlarged prostate prominent in the bladder is covered merely by mucous membrane, so that when this latter is scraped through and detached the true capsule of the prostate is at once reached. Keeping the point of the finger in close contact with the capsule, the enucleation of the prostate out of the enveloping sheath outside the bladder is proceeded with, by insinuating the finger-tip in succession behind, outside, and in front of one lateral lobe, thus gradually separating the capsule from the sheath. The finger is successively swept in semicircular fashion from behind to the front of the lobe till the triangular ligament is reached. The other lobe is similarly detached from the sheath, the finger completely sweeping round the vesical end of the prostate. During the course of these manipulations it will be found that, as a rule, the anterior commissure of the prostate will have opened out; indeed, in a large proportion of cases it will have already opened out in the course of the prostatic enlargement, the prostatic urethra assuming the form of a deep furrow rather than a tube. The finger is then passed down deeply behind the gland, and first one lobe and then the other detached with ease from the triangular ligament. The prostate now lies loosely in the sheath, hanging on merely by the urethra and the ejaculatory ducts. During the course of the enucleation the urethra anterior to the verumontanum becomes detached from the lobe so that the finger-point can be inserted between the urethra and the lobes on either side. If the tip of the finger now be placed behind the prostate in the middle line above the ejaculatory ducts and the prostate be propelled upwards into the bladder by the finger in the rectum, the urethra will be found to snap across at the verumontanum, leaving the ejaculatory ducts, as a rule, adherent to the anterior portion of the prostatic urethra that is left behind.

The prostate which now lies free in the bladder is withdrawn by strong forceps through the suprapubic wound. And here I may remark that it is astonishing through what a comparatively small wound a very large prostate can be delivered owing to the elasticity and compressibility between the blades of the forceps of the adenomatous growth. In the vast majority of cases the prostate has opened out like an oyster along its anterior commissure in the course of the enucleation. The forceps should be applied to one

of the lobes which is withdrawn through the wound, the other lobe following. In this manner the prostate is delivered through a wound in the bladder one-half the size that would otherwise be necessary.

When I first conceived the possibility of removing the whole prostate, my ideal operation consisted in enucleating the enlarged gland entire in its capsule out of the enveloping sheath, leaving the urethra behind; and this was the procedure attempted in my earlier cases. An accident which occurred during the operation on my eighth case had, however, the effect of modifying my views in this respect. In that case though the urethra was undesignedly torn across no untoward result ensued, the patient making a thorough recovery and living for six years untroubled by any urinary symptom. Further experience taught me that the prostatic urethra may be removed in part, or even entire, with the gland with impunity. The excellent results obtained by the operation above described have long since convinced me that no advantage is to be gained by leaving the vesical end of the urethra behind. In a large proportion of cases of enlarged prostate this vesical end of the urethra is widely dilated, being trumpet-shaped, gutter-shaped, or distorted out of any shape resembling a more or less circular tube, as in the normal prostatic urethra. Even when left behind I always had my doubts as to its ultimate fate in most instances. The probability is that, through want of support and adequate blood supply, it sloughed in large part and came away in the washings during the after-treatment.

Examination of the prostates which, in removal, have opened along the anterior commissure—to which category the great majority belong—shows that the dilated portion of the prostatic urethra, viz., that portion lying between the verumontanum and the vesical outlet, has come away with the prostate, the urethra in front of this, which is loosely attached to the lateral lobes, being left behind.

No cutting instrument is necessary or desirable for incising the mucous membrane over the prostate, the finger-nail alone being most convenient and expeditious. Besides, if scissors or scalpel be employed there is danger of cutting through the capsule, and, the guiding line being lost, the finger flounders about inside, enucleating isolated adenomatous tumours instead of the organ entire in its capsule.

With the delivery of the prostate from the bladder the essential part of the operation is completed. The forefinger of one hand is



reintroduced into the bladder forthwith and that of the other hand into the rectum. The opposing surfaces of the cavity from which the prostate has been enucleated are then pressed together all round the vesical orifice between the tips of the fingers. By thoroughly kneading the opposed surfaces together in this manner the contraction of the cavity is facilitated and hæmorrhage is thus arrested, as when a dentist presses the gum after the extraction of a tooth, or the accoucheur does the flaccid womb, after parturition, with a similar object in view.

The bladder is then irrigated with hot boracic lotion (temperature about 110° F.) through the catheter still *in situ* for the purpose of removing clots, and, further to check bleeding. This process should not, however, be continued for more than a minute or two, as I find from experience that these irrigations not infrequently promote bleeding instead of diminishing it, if continued too long.

The bladder having been cleared of clots a stout india-rubber drainage tube is introduced through the suprapubic wound. The dimensions and management of this tube are of the utmost importance in the after-treatment. I now employ a tube  $\frac{3}{4}$ th inch in diameter with a lumen of  $\frac{5}{8}$ th inch. Two large perforations or eyes are made near the vesical end of this tube on opposite sides of it. Only about an inch of the tube should project in the bladder, just sufficient for the side openings to lie completely within its cavity. When the bladder is allowed to contract the tube is gripped by it so that the whole of the urine escapes through the tube. On no account should the tube be inserted into the prostatic cavity, our object being by every means to facilitate the contraction of this cavity.

The edges of the parietal wound are now brought together above the tube by silkworm gut sutures, one or two of which should pass deeply through the recti muscles. Buried sutures should not be employed as they are certain to be infected by the urine. The tube is retained in position by suturing it to the skin on either side. These latter sutures may be removed in forty-eight hours, the tube being then retained by the grip of the bladder.

A couple of inches of iodoform gauze tape are inserted in the angles of the wound above and below the tube for the purpose of preventing the accumulation of fluids in the pre-vesical space. The wound is covered with cyanide of zinc gauze and the patient deeply swathed in absorbent dressings applied to the front, sides, and back, and kept in position by a many-tailed bandage. Cotton-wool, wood-

wool tissue, or cellulose may be employed. The last is the most absorbent and keeps the patient driest, but a thin layer of cotton-wool should be placed between it and the skin, as the cellulose when wet forms a pulp and adheres to the skin, inducing a cold, clammy feeling.

Space will not admit of my going into details of the after-treatment which would form the subject for a paper in itself. The dressings are changed every four to six hours when saturated with urine. The bladder is irrigated twice daily through the tube first and, when this is removed, through the wound. The large tube is removed after four days, but before doing so a small tube is introduced through its lumen and left in till the tenth or twelfth day. After this period a full-sized rubber or gum-elastic catheter is passed through the urethra daily till the suprapubic wound completely closes, and the bladder is irrigated in this way. But on no account should a catheter be tied in after the operation. The suprapubic wound as a rule completely closes in from a fortnight to three weeks, when the patient passes his urine naturally, without the use of a catheter, as well as he ever did.

*Results from the Operation.*—I have now completed 664 cases of the operation of total enucleation of the prostate for enlargement of that organ, the patients varying in age from 49 to 89 years with an average age of 69 years. There were forty-nine octogenarians between the ages of 80 and 89 and ten patients aged 79 years. The prostates ranged from  $\frac{1}{2}$  to 17 ounces, with an average weight of about  $2\frac{1}{4}$  ounces. The great majority of the patients had been entirely dependent on the catheter for periods varying up to twenty-four years. Nearly all were in broken health, and many apparently dying before operation. Existence was simply unendurable to most of them. Few were free from one or more grave complications, such as cystitis, stones in the bladder, pyelitis, kidney disease, diabetes, heart disease, chronic bronchitis, paralysis, hernia, and in a few instances there was malignant disease of some other organ than the prostate. Such were the unfavourable circumstances under which the operation was undertaken.

In connection with these 664 operations there were forty deaths in periods ranging from four hours to thirty-seven days after the operation, or a mortality of 6 per cent. The mortality has been steadily decreasing from 10 per cent. in the first 100 cases to 4.24 per cent. in the last 200.

The causes of death were: Uræmic symptoms due to chronic kidney disease, 16; heart failure, 6; septicæmia, 2; shock, 5;

exhaustion (kidneys much, diseased) 1 ; mania (hereditary in 1), 2 ; malignant disease of liver, 2 ; heatstroke, 1 ; pneumonia, 1 ; acute bronchitis, 2 ; pulmonary embolism, 1 ; and cerebral hæmorrhage with paralysis, 1.

Though all these deaths are accepted in connection with the operation, in not more than half the number can the fatal result be attributed thereto, the remaining deaths being due to diseases incident to old age and unconnected with the operation.

In 110 cases vesical calculi were removed at the same time ; but all the deaths in these cases are accepted in connection with the prostatectomy, none being put down to the suprapubic lithotomy involved.

When I speak of success attending this operation I mean an absolute and complete success, the patients regaining the power of retaining and passing his urine naturally, without the aid of a catheter, as well as he ever did. There is no relapse of the symptoms, no contractions at the seat of operation leading to stricture, and no fistula remaining. Further, there is no diminution in the sexual power after the operation.

#### DISCUSSION.

Major SPENCER said the best thanks of the meeting were due to Colonel Freyer for his exceedingly clear and instructive address ; the operation Colonel Freyer had devised was an excellent one, which he had had the privilege of seeing him perform ; the results were most encouraging, and in Colonel Freyer's hands the operation appeared fairly easy, though that would probably not be the case in the hands of an operator with less experience of the particular procedure.

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## Clinical and other Notes.

### THE TREATMENT OF KALA-AZAR BY THE USE OF SENEGA.

BY CAPTAIN H. ENSOR.

*Royal Army Medical Corps.*

Two cases of kala-azar have been treated with senega in the hope that this drug might bring about a permanent cure of the disease, which up to the present has almost invariably proved fatal.

*Case 1.*—Private M. H., Medical Corps, Egyptian Army, was admitted to hospital at Wad Medani, Blue Nile district, on July 8th, 1909, suffering from an irregular fever which was supposed to be malarial in origin. He had served for some months previously at Keili in the district of Senaar, where kala-azar is known to exist among the inhabitants. As his condition did not improve after treatment by quinine at Wad Medani he was transferred to Khartoum, arriving there on August 8th, 1909. He was on arrival isolated as a suspected case of kala-azar, and on three occasions splenic puncture was performed, but neither the Leishman bodies diagnostic of kala-azar nor malarial parasites could be demonstrated in the blood so obtained.

On August 18th he came under my care, and on examination it was found that the spleen was much enlarged, the anterior border being palpable as far forward as the umbilicus. The liver was not enlarged to any appreciable degree, and he complained only of slight pain in the spleen, and of evening headaches. After his admission to the Military Hospital at Khartoum his temperature was remittent in type, ranging from 101° F. in the mornings to 103·5° F. in the evenings. He was extremely emaciated, profoundly anæmic, and his skin had lost the gloss so noticeable in a healthy Egyptian, and was of dull greyish-yellow colour. The conjunctivæ showed no bile staining, and there was no diarrhœa. He was treated with atoxyl, given hypodermically.

On August 21st his spleen was again punctured, a very fine needle being used, and on examining the blood so obtained several Leishman bodies were found by Captain Archibald, R.A.M.C., and myself. The case having thus been definitely proved to be one of kala-azar, I determined to try the effect of senega, as it appeared to me that this drug might possibly be of use on account of its active principle, saponin, which in high dilutions is destructive to protozoa. The tincture was the preparation selected, and on August 22nd the patient was given half-drachm doses in 1 ounce of water three times a day; all other treatment was stopped. At the time this drug was first given the patient's general condition was very bad, and I believed he could not live more than a few days.

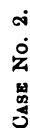
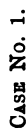
To my surprise the patient soon after the senega treatment had been begun showed signs of improvement, although the course of the temperature remained about the same as formerly; on August 30th his spleen was found to have become greatly reduced in size, and the patient himself was obviously better, and took food with some appetite. Captain Archibald and I agreed that a surprising amount of improvement had taken place, the most noticeable feature being the change in the man's appearance, his skin having lost the greyish-yellow tint which was formerly so noticeable. A blood count on August 26th showed that the red blood cells numbered 2,130,000, and the white blood corpuscles 1,600 per cubic millimetre. The differential count gave the following results: Polynuclears, 26 per cent.; lymphocytes, 48 per cent.; large mononuclears, 26 per cent.

From August 30th to September 3rd the patient improved in every way, but on September 4th he complained of swelling of the upper lip, and on examination of his mouth it was seen that stomatitis had occurred round the alveoli of the two central incisor teeth of the upper jaw. This rapidly became gangrenous, and the patient's temperature, which before the onset of this unfortunate complication, was beginning to remain at, or about, normal, became an intermittent one. The cancrum oris was energetically treated, the effected teeth were removed, and the mouth rinsed out every hour with Sanitas 1 in 10. The sloughing mucous membrane of the affected portions of the two superior maxillæ came away rapidly, and on September 11th, the gangrenous process appeared to be at an end, and the patient again seemed to be gaining ground, although his temperature remained intermittent in type. He, however, took food well, and was quite cheerful. Blood counts were taken during this period, but owing to the suppurative process going on in the patient's mouth they were of no importance in connection with such a disease as kala-azar, as the leucocytosis which occurred could not be attributed to the influence of the treatment adopted.

The patient's spleen continued to diminish in size, and on September 17th was found to have retreated to the margin of the ribs.

On September 19th two bedsores developed in spite of all care, and on the 21st of the same month the tissues of the right side of the neck became swollen and hard to the touch; this infiltration rapidly extended to the left side, and appeared to cause some difficulty to respiration and deglutition, but it was never of so urgent a nature as to make operative interference necessary. On the appearance of this final complication the patient rapidly slipped downhill, and died on September 25th, at 8.45 a.m.

A *post mortem* was made within thirty minutes of death. The liver was found to weigh 43½ ounces, and appeared to be normal on section, the spleen was enlarged and weighed 15 ounces, but otherwise appeared to be normal. The intestines showed no sign of ulceration, but the mesenteric glands were for the most part enlarged. Smears were taken from the liver and spleen, and portions of both these organs prepared for



examination in sections. No Leishman bodies could be found after prolonged search in any of the smears from the liver and spleen, and Captain Archibald, who was so kind as to take charge of the work of preparing and cutting sections from the selected pieces of organs, reported that no Leishman bodies could be found in any of the sections of the liver, spleen, and a mesenteric 'gland, which was also examined in the same way. The liver showed the presence of slight intralobular cirrhosis, while the spleen was normal, except for the presence of malarial pigment.

*Case 2.*—Private A. F., Department of Works, was admitted to Khartoum Military Hospital on August 24th, 1909, suffering from fever. He had served at Gedarif, in Kassala District, where kala-azar exists, from November, 1907, to June, 1908, and during his period of service at that station he suffered only on one occasion from fever, which lasted six days, and was treated with quinine. He proceeded on furlough to Cairo, of which city he is a native, at the end of June, 1908 and returned to Khartoum for duty in October of the same year, since when he has remained at the last-named station. His medical history sheet shows one admission to hospital, from January 27th to January 30th, 1909, for colic, but no other admissions of any kind are recorded until August 24th, when he was admitted suffering from fever.

The spleen was found to be markedly enlarged and there was some enlargement of the liver in a downward direction. He was not anæmic, and appeared to be in fair condition, but his skin was dull and of an earthy-greyish tinge. The conjunctivæ showed no bile staining. His blood was examined for malarial parasites on three occasions, but none were found. Intra-muscular injections of quinine were given without producing any effect on the fever.

On August 28th, Captain Archibald, who had examined one of the blood-films, reported that he had noticed a suspicious blue-staining, vacuolated body, showing dots of chromatin, which he, from previous experience, is inclined to think has some connection with kala-azar.

On this evidence the patient's liver was punctured, and, on examination of the blood so obtained, one undoubted Leishman body and also several others of a suspicious nature were found. The case having been proved to be one of kala-azar, it was decided to try the effect of senega, and this drug was first given on August 30th, in half-drachm doses, and the dosage gradually increased until the patient was taking  $2\frac{1}{2}$  drachms three times a day by September 8th. A blood count was made on August 30th, and the red cells numbered 4,730,000, and the white blood corpuscles 2,500 per cubic millimetre. Other blood counts were made on September 18th and September 24th, the blood on both occasions being obtained at least three hours after food. The count of September 18th showed 4,691,000 red blood cells and 9,450 white blood corpuscles per cubic millimetre, while that of September 24th showed 4,920,000 red cells and 11,000 white blood corpuscles. These three counts show a change from a well-

marked leucopenia on August 30th, to a moderate leucocytosis on September 24th, and this great change can only be attributed to the action of the senega, as no other drug was used, and the patient was not suffering from suppuration in any part of his body.

The temperature, which had been intermittent in type before senega was first given, became, as will be seen from the accompanying chart, quite normal on September 9th.

On September 27th the liver was again punctured, and the blood so obtained examined most carefully, but no Leishman bodies could be seen after a prolonged search. The patient's temperature, as a result of the liver puncture no doubt, rose to 103° F. the same evening, but fell to normal the following morning, and has remained so up to the present time. The liver puncture was performed with great care, and the rise in temperature was probably due to neurosis, as the patient is of a very nervous temperament, and has a strong objection to having his liver punctured.

On September 14th the senega was stopped, not because it was causing any symptoms, but for fear that the drug might have a cumulative action. On September 23rd it was again given in one-drachm doses three times a day, and the patient is at present taking this amount without showing the least signs of discomfort. The present condition of the patient is that of a man in perfect health, the liver is of normal dimensions, and the spleen is not palpable. Is all this improvement due to the treatment adopted, or is it merely one of the periods of improvement so often seen in kala-azar?

As I have mentioned above, senega was tried as a treatment for this disease in the first place, because of the saponin it contains, but the blood counts taken in Case 2 appear to show that it produces a distinct leucocytosis, and Captain Archibald suggested that it was producing its apparent good effects by exciting leucocytosis. It will be remembered, perhaps, by readers of this Journal, that Major Cummins, R.A.M.C., sometime ago called attention to the improvement that sometimes followed cancrum oris, which is a not infrequent complication of kala-azar, and suggested that this improvement was due to the leucocytosis consequent on the accompanying suppuration. To test whether senega does produce a leucocytosis it was decided that I should take one-drachm doses of senega three times a day for the period of a week, and that my blood should be examined before the commencement of the course of senega, and at the end of it. Accordingly on September 17th, at midday, four hours after food, my blood was examined, and Captain Archibald and I made the count to be 4,840,000 red cells and 6,500 white blood corpuscles per cubic millimetre. I then took 1 drachm of the tincture of senega three times a day up to September 22nd, when my blood was again examined, and the white blood corpuscles were found to number 9,062 per cubic millimetre. From this date to the end of the week the senega was



reduced to 1 drachm twice a day, as its effect on me was a very unpleasant one; I seemed to be saturated with it, and everything I ate or drank appeared to taste of it. On September 24th at midday, my blood was again examined, and the count showed that I possessed 5,300,000 red blood cells and 8,618 white blood corpuscles.

Captain Archibald and I think the result of this experiment proves that senega has a distinct effect in producing a leucocytosis, and perhaps in this way has some curative action when used in the treatment of kala-azar, apart from its presumed specific action by virtue of the saponin it contains.

The results so far obtained are to some extent promising, and the drug merits a further and more extended trial, which I hope will be accorded to it in the Sudan. As far as I am aware, senega, up to the present, has only been used in medicine as an expectorant in various diseases of the lungs.

On consulting Whitt's "Materia Medica" I find that senega does not contain as much saponin as the non-official drug *Quillaia saponaria* (soap-bark) of the U.S.P.; indeed the amount of saponin contained in the latter drug is said to be five times that found in senega, and it is in addition said to be more pleasant to take. Consequently I intend, if possible, to obtain some of the decoction of quillaia, and to use it in the treatment of any other cases of kala-azar which may come under my care.

### BACILLUS TYPHOSUS IN FLIES.

By MAJOR N. FAICHNIE.

*Royal Army Medical Corps.*

In a recent paper, "Fly-borne Enteric Fever—the Source of Infection," it was stated that probably the most important source of fly infection in enteric fever was from flies bred in enteric excreta, the insects thereby becoming carriers of the bacilli for the rest of their lives, and spreading the infection by means of their excreta. To obtain corroborative evidence that the bacilli I isolated from flies caught at Kamptee were really *B. typhosus*, I sent the cultures to Lieutenant-Colonel Semple, Director of the Central Research Institute, Kasauli, who stated, after examination, that they were both undoubtedly *B. typhosus*, and the following is a copy of his report:—

- |                            |    |    |   |
|----------------------------|----|----|---|
| (1) Microscopic characters | .. | .. | Short motile rods, round ends. Gram negative. |
| (2) Ordinary agar          | .. | .. | Good growth, even.                            |
| (3) Ordinary broth         | .. | .. | Uniform turbidity. No scum. No indol.         |
| (4) Litmus mannite         | .. | .. | Slight red.                                   |
| (5) Litmus glucose         | .. | .. | Red.  |
| (6) Litmus lactose         | .. | .. | No change.                                    |

- |   |  |
|---|--|
| (7) Litmus milk .. .. .                         | No change.   |
| (8) Litmus whey .. .. .                         | No change.   |
| (9) Neutral red agar .. .. .                    | No change.   |
| (10) Drigalski-Conradi medium .. .. .           | Typical colonies.  |
| (11) Specific serum .. .. .                     | Typical agglutinations.  |
| (12) Rabbits immunised with these cul-<br>tures | Supplied serum which agglutinated stock<br>cultures of <i>B. typhosus</i> in high dilutions. |

P.S.—Test 12 is very confirmatory of all the others.

As continued proof of the arguments set forth in the paper referred to, I now record the results of further experiments in which by *B. typhosus* is meant a bacillus that gives the following reactions :—

- (1) Agglutination with a specific *B. typhosus* serum in a dilution of 1 in 10,000.
- (2) Litmus milk—no clotting in seven days.
- (3) Glucose—acid.
- (4) Lactose—negative.
- (5) Mannite—acid.
- (6), (7) and (8) Dulcitate, cane sugar and inulin, all negative. The bacillus is rod-shaped, Gram negative and motile.

By *B. paratyphosus* A is meant a bacillus which is agglutinated by a specific *paratyphosus* A serum in a dilution of 1 in 10,000.

- (1) Litmus milk—no clot in seven days.
- (2) Glucose—acid and gas.
- (3) Mannite—acid and gas.
- (4) Dulcitate—acid and gas.
- (5) Lactose—negative.
- (6) Cane sugar—negative.
- (7) Inulin—negative.

The bacillus is also rod-shaped, Gram negative and motile.

On August 12th, 1909, 3 ounces of fæces, containing *B. typhosus*, were thrown on a box of earth and covered with a wire cage and about thirty flies were let loose inside. These flies all died in a day or two, but on August 26th, 1909, fourteen days later, one fly hatched; on August 27th, 1909, twelve flies were hatched; on this same day, after the flies were hatched, the box of earth was replaced by an earthenware plate which had been previously washed in a solution of 1 in 500 perchloride of mercury : sugar and water as food in separate porcelain saucers were also introduced, and the wire cover was changed for a bell-shaped mosquito net. On August 26th, one fly, one day old, was transfixed with a red-hot needle after chloroforming it, flamed, and put into a bottle of sterile salt solution. It was shaken up and 1 cc. of this solution was put into McConkey broth, which remained unchanged in forty-eight hours. After this the fly was crushed with a sterile glass rod and a drop plated; *B. typhosus* was found. On August 27th, four flies, each one day old, were singed and examined in the same way. The control in McConkey was negative, but from the crushed flies *B. typhosus* was separated.

On September 3rd, two flies, each six days old, were examined in the same manner. The McConkey control was negative, and *B. typhosus* was separated from the crushed flies.

On September 6th, two flies, nine days old, were examined, with the same results.

On September 10th, two flies, thirteen days old, were put in a dry sterile bottle and left for twenty-four hours; they were then removed, and some salt solution was poured into the bottle, and from this solution of excrement *B. typhosus* was obtained. The two flies were then crushed in salt solution (they were not flamed on this occasion), and *B. typhosus* was obtained.

On September 13th, one fly, 16 days old, was put into a sterile bottle for half an hour, and removed; two drops of excrement were visible, and from the sterile salt solution added *B. typhosus* was obtained. The fly was flamed and crushed as before, with the same result.

The same day another fly, 16 days old, was treated as above, but *B. typhosus* was not recovered.

A second series of experiments was carried out with the fæces of a man suffering from paratyphoid fever (*paratyphosus* A), the diagnosis having been made by a blood culture. On August 22nd, 2 ounces of liquid fæces, containing *B. paratyphosus* A, were put in a box of earth, and about thirty flies allowed to feed on it; as the flies had no water given to them they died in a day or two. On September 1st one fly hatched out; on September 3rd twelve flies were seen. On the same date the earth was replaced by a plate as before. On September 1st one fly, one day old, was examined; the McConkey control was negative; and after being flamed and crushed, *B. paratyphosus* A was obtained. On September 3rd four flies, each one day old, were examined; the McConkey control was negative; and from the crushed flies *B. paratyphosus* A was separated.

On September 10th three flies, each seven days old, were put through the sterile bottle test, the excrement was examined, and from it *B. paratyphosus* A was obtained. The flies themselves were then examined; the McConkey control was negative; but *B. paratyphosus* A was recovered from the crushed flies.

On September 13th one fly, ten days old, was examined, but the bacillus was not recovered. Two other flies, also ten days old, were examined, and *B. paratyphosus* A was recovered.

*Remarks.*—From the foregoing experiments it will be seen that out of thirteen flies bred from a typhoid stool at least six contained *B. typhosus* in their intestines; and the bacillus was recovered from the excrement and intestine of a fly sixteen days old. Similarly from a paratyphoid stool at least four flies out of eleven contained *B. paratyphosus* A in their intestines. In each there was only one fly in which one or other bacillus was certainly not present.

Since writing my first paper on this subject, I have found *B. typhosus* in flies from Sehere, once; from Kamptee, twice; from Nasirabad, once in flies from the bungalow of an officer who had enteric fever, and once from flies in the Officers' Mess there; from Nowgong, twice, once in flies from the Royal Artillery coffee-shop, and again in flies from the trenching ground, making a total of nine times in three months. Except those from Nasirabad, the flies were always flamed before examination, and a control of the wasted flies was taken before crushing, so there is no doubt the bacillus was actually in the interior of the fly, most probably in the intestine.

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### WATER STERILISATION IN CAMP.

By MAJOR J. MCCARTHY.

*Royal Army Medical Corps.*

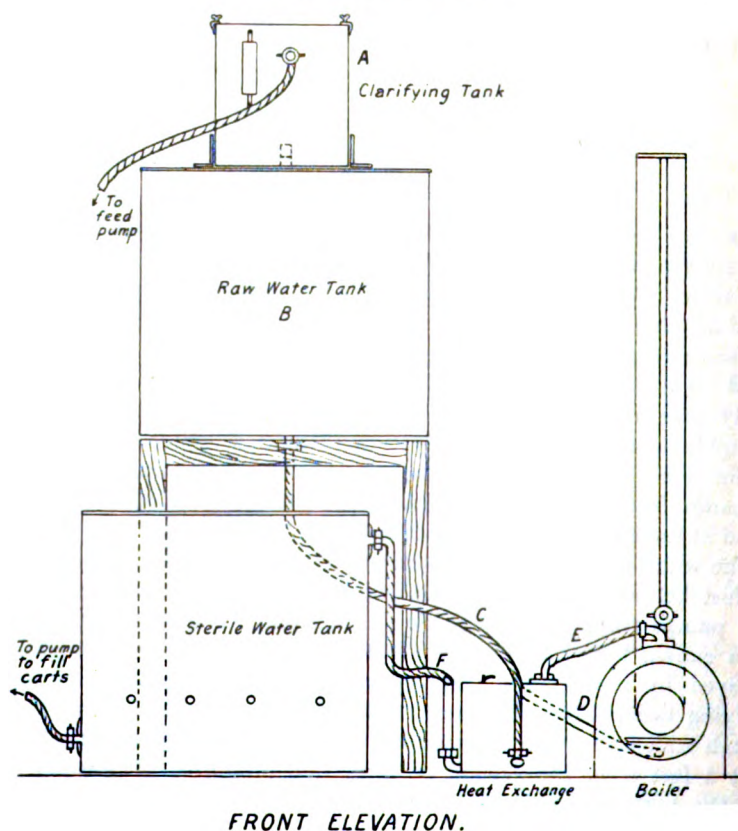
It may be of some interest to readers of the Journal to hear how the latest pattern of Griffiths' water steriliser has worked while in use at Caerwys Camp, North Wales. The West Lancashire Territorial Division, about 12,000 strong, arrived in camp on August 1st. There was some doubt whether the quantity of water in the town reservoir would be sufficient for the needs of the troops, and as other sources of supply were found unsafe for drinking purposes, it was thought advisable to supplement the town supply with sterilised water from the other sources if necessary. To do this, three Griffiths' sterilisers were sent to the camp from the makers, Messrs. Cooper and Company, and were placed at the end of the infantry lines.

The water to feed the sterilisers was derived from a spring in a ravine. 200 feet below the camp, and to pump it up to the camp four lift and force pumps worked by hand were employed. The water was received into a canvas trough 30 feet by 2 feet by 2 feet. From this trough it was conveyed by means of a semi-rotary hand pump to a small circular clarifying tank, *A* (see diagram). This clarifier contains layers of canvas through which the water passes on its way to a 200-gallon tank, raised about 4 feet from the ground on a wooden platform. The water passes from the bottom of this tank through a tube, *C*, into a heat exchange apparatus, which consists of a copper box, containing a coil of narrow metal tubing, through which the cold water circulates on its way to the boiler through tube *D*. Here it circulates in a jacket round a cylinder, containing the fire, and when the temperature of the water reaches 176° F. a valve fixed in the top of the jacket opens automatically, and allows the sterile water to pass back along a tube, *E*, into the heat exchange box again, where it flows over the coiled tubes containing the cold water, and is thus cooled down rapidly to within about 15° of the original temperature of the cold water, and it finally passes by tube *F*

into the lower 200-gallon tank, which is placed on a level with the heat exchange box, by sinking it partially in the ground.

The automatic valve in the boiler cannot open till the temperature of the water in the jacket reaches 176° F. By this arrangement it is made certain that sterilisation is attained before the water can pass back into

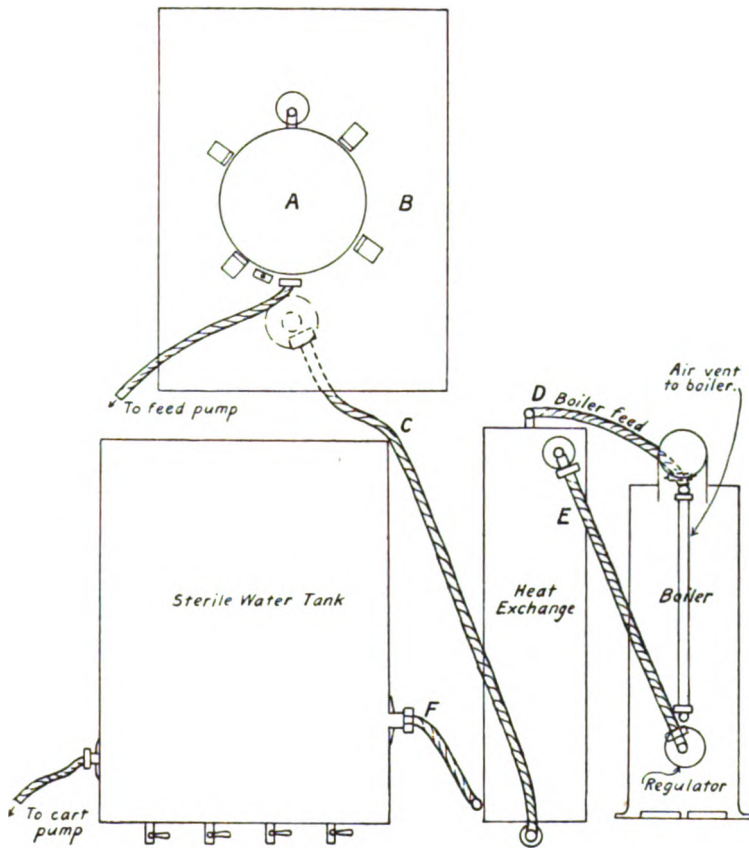
GRIFFITH WATER STERILISER, 200-GALLON CAPACITY. STANDING CAMP PATTERN No. 7.



the heat exchange box, as a fall in temperature below 176° causes the valve to close again. That sterilisation is obtained at this temperature has been satisfactorily proved by repeated experiments at the Army School of Sanitation by Brevet-Colonel Firth. He finds that exposure to a temperature of about 176° F. for a few seconds is enough to kill organisms which produce such diseases as enteric fever, dysentery, cholera, and infective diarrhoea. Of course, this temperature does not

destroy spore-bearing organisms, but as the presence of these forms alone in water does not give rise to disease, as far as is known at present, they need not be taken into consideration in connection with methods of sterilising water for drinking purposes.

The automatic valve contains certain metal capsules containing pure alcohol. When they are immersed in water having a temperature of

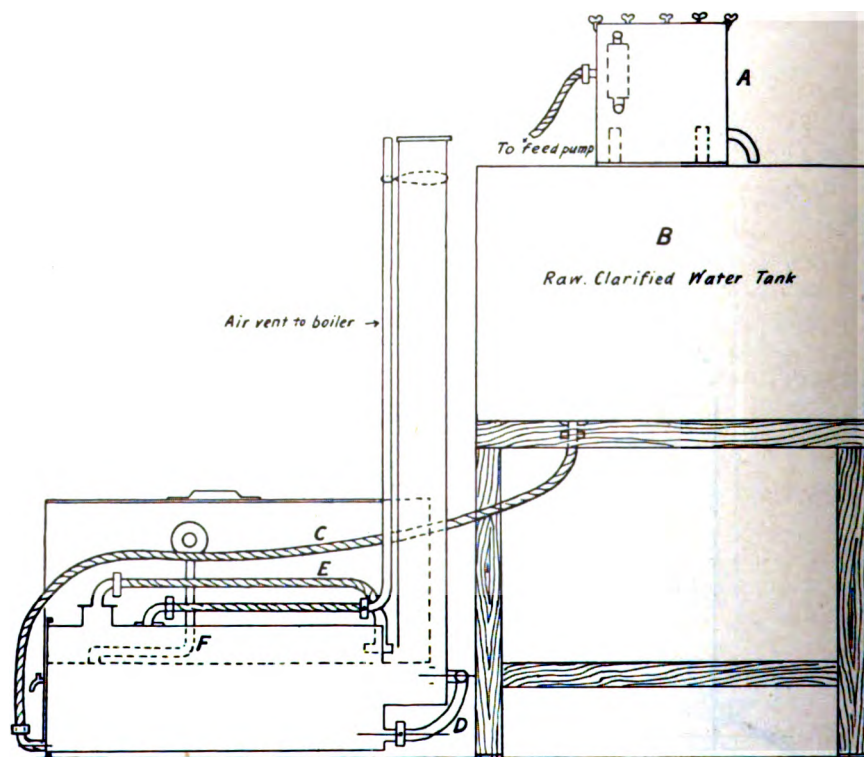


PLAN.

176° F. they expand, and being retained firmly by a stirrup against the bottom of a spring, force up the plug which opens a valve. This arrangement of expanding capsules is conveniently controlled or adjusted by manipulations of the screw nuts over and under the ends of the cross bar, and once accurately adjusted, requires practically no further atten-

tion, beyond occasional inspection to see that the capsules are sound and in position. Spare capsules are provided with the machine.

These sterilisers were in use in Caerwys Camp for thirteen days, and as the demand for sterile water was considerable, it was found necessary to use two canvas troughs 30 feet by 2 feet by 2 feet, in addition to the 200-gallon tanks for the reception of sterile water. These troughs were kept filled with sterile water, and to do this the sterilisers were working, on an average, twelve hours daily.



*SIDE ELEVATION.*

The regiments sent their water-carts at definite hours during the day, and these carts were filled from the canvas troughs by means of a lift and force pump. This pump filled a water-cart tank in about ten minutes.

The three sterilisers were kept working satisfactorily by Corporal Freeman and nine men of the Royal Army Medical Corps, all of whom



had received special instructions in methods of water sterilisation at the Army School of Sanitation.

It was found necessary to work the machines twelve hours a day for the thirteen days they were in use, in order to keep the supply above the demand. This meant hard work and careful stoking of the fires so as to keep the temperature of the water in the boiler up to 176° F.; that being the temperature at which the automatic valve opens. They had also to see that there was a constant supply of water in the upper tank, B, otherwise the circulation of water through the apparatus would soon cease.



Three men were told off to each steriliser, and as the working hours were long, Captain Graham, the Staff Officer to the Army Medical Corps of the division kindly sent me men of the Territorial Royal Army Medical Corps from the water squad in camp to act as reliefs at the pumps.

Corporal Freeman took the opportunity to instruct these men daily in methods of water sterilisation. The fuel used was coal, and once the fires were well alight it was found that, with good stoking, the quantity required was not very large.

The lift and force pumps which forced the water up 200 feet from the ravine below the camp were worked by hand, and as they were very stiff, it was found necessary to have fatigue parties, sixteen men at a time, four



to each pump. These men were sent from the brigades in turn and were relieved every three hours.

The following details were noted while the sterilisers were working, and will show what they are capable of doing:—

(1) The fire in the boiler was lighted at 6.30 a.m. In twenty-five minutes the hot water began to pass through the automatic valve.

(2) From the time the water began to pass the valve it took one hour and ten minutes to fill a 200-gallon tank with sterile water.

(3) The sterilisers were working twelve hours daily, and during that time about 88 lb. of coal were used for each steriliser: roughly speaking, two sterilisers working twelve hours a day for thirteen days, consumed 1 ton of coal.

(4) Each steriliser turned out 2,300 gallons of water in twelve hours. This amount was produced daily, and necessitated constant attention to stoking, and keeping a steady supply of raw water in the upper 200-gallon tank to feed the steriliser.

In conclusion, I have only one remark to make in connection with this method of purifying water. The temperature of the sterile water issuing from the heat exchange box is a great drawback. It is distinctly warm, and very unpleasant to drink. Even after it had been for some time in the open canvas troughs, it did not cool down to a drinkable temperature. If the water is not wanted at once, it of course does not matter, but when the demand for water is urgent, as it was at Caerwys, there is no time for it to cool. It had to be pumped immediately into the metal tanks on the water-carts, which were themselves very hot after exposure to the sun, so the water had no chance to cool down.

In big chemical works, a good method of cooling hot sulphuric acid and other liquids is adopted, a simple modification of which might be tried in connection with these sterilisers, provided the apparatus is to be stationary for some considerable time, as, for example, in general hospitals, stationary hospitals, outposts on lines of communication, and in more or less permanent camps. The method consists in cooling the liquid by letting it fall on to a slightly convex metal plate. This spreads it out in a thin sheet, and serves to cool it a little. It then trickles down through a tower filled with flint stones. When the liquid arrives at the bottom of the tower it is quite cold.

A modification of this might be tried for cooling the sterile water still further. It might be passed, after leaving the heat exchange box through a large barrel filled with clean stones, flint for preference if obtainable, and then into open troughs or other receptacles. I do not think the passage through the barrel of stones would check the rate of delivery to any appreciable extent.

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A CASE OF CONGENITAL SYPHILIS WITH *POST-MORTEM* NOTES.

BY CAPTAIN H. A. EMERSON.

*Royal Army Medical Corps.*

THE following case appears to be worthy of record on account of the unusual *post-mortem* findings.

In January last the wife of a soldier in the "X" Regiment was delivered of a living "blue" baby. Previous to this she had three miscarriages and one stillborn infant at full term.

The child was seen about twelve hours after birth and was found to be very asphyxiated. The whole body was cyanosed; face, hands and feet in particular, while the nails were almost black. The pulse and respiration were very fast. No cardiac murmur was audible over the precordia, nor between the scapulæ behind. The infant refused to swallow anything except two or three drops of brandy that were poured down its throat. No meconium came away, though the anus was patent. Urine was passed so freely that the napkins had to be changed about every half hour.

The case was diagnosed congenital malformation of the heart and was considered hopeless. No change occurred, and death ensued the same evening, twenty-three hours after birth.

The father entered the Service as a boy at the age of 15. His medical history sheet contains no entry for syphilis. The mother stated that at the age of 14 she had an illness during which all her hair fell out, but she had no rash. As her people were in poor circumstances, no doctor was called in, so that she never knew what the disease was. During the course of this pregnancy she has been quite well.

*Post-mortem* examination was performed eight hours after death. An aperture about  $\frac{1}{2}$  inch in diameter was found between the auricles in the floor of the fossa ovalis. Innumerable ulcers were found, studded throughout the whole length of both large and small intestines. These ulcers varied from  $\frac{1}{2}$  to 1 inch in length and  $\frac{1}{4}$  to  $\frac{1}{2}$  inch in breadth. They were situated on the free border of the intestines, the majority lay longitudinally, though a few lay transversely, and had almost completely encircled the gut, causing a partial stricture. The edges were thickened, rolled and indurated, and the bases were covered with grey adherent sloughs. The mesenteric glands were enlarged and shotty. The other organs appeared to be normal.

Pieces of all the organs were removed and stained by Levaditi's silver method. The wall of the intestines contained an enormous number of *Spirochæta pallida*, especially underneath the ulcers where they formed a dense network. In the necrotic tissue of the floor of the ulcers a large number of Gram-positive rods were found. These were rather thick,

about 4 microns long, and showed a decided curve. Unfortunately no cultures were made. The other organs contained a few spirochætes but no bacteria.

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REPORT ON BALSAM OF PERU AS CONTRASTED WITH  
UNGUENTUM SULPHURIS AND OTHER METHODS IN  
THE TREATMENT OF SCABIES IN THE ARMY.

By MAJOR H. C. FRENCH.

*Royal Army Medical Corps.*

(1) THE scheme outlined in War Office Letter 24, General Number 1751, A.M.D. 2, dated April 5th, 1909, in regard to the treatment of scabies by balsam of Peru, as performed at Aldershot, has been thoroughly carried out. The cases were discharged from hospital when free from itching, or obvious signs of scabies; they are given in Appendix B.

(2) Cases of scabies can be divided roughly into severe, moderate, mild, or complicated. The nature of the case, as explained in paras. 4 and 7, necessarily affects the duration in hospital.

The usual sites of scabies are: (a) Between fingers, extending on to inner side of wrist; (b) penis, then abdomen and buttocks, very common amongst soldiers; venereal diseases usually coexist; (c) armpits, very rare.

(3) Balsam of Peru costs 10s. a lb., sulphur is cheap. Balsam of Peru is no more efficacious than sulphur in "experienced hands." If sulphur is used it must be thoroughly done in the manner indicated in Appendix C, in order to guard against a sulphur dermatitis, or sulphur eczema, which is worse than the itch and more difficult to treat, and for this reason balsam of Peru, and balsam of Gurjun, have been recommended in preference to unguentum sulphuris. Balsam of Gurjun costs 9d. a lb., and will probably suffice if the preliminary steps (the crux of the whole matter) are "thoroughly" done.

(4) The duration in hospital is very largely influenced by: (a) Accurate diagnosis and early recognition of the condition in barracks, and, consequently, less prolonged treatment in hospital is necessary; (b) employment of specially trained officers and orderlies at certain large stations, such as Aldershot, Woolwich, London, &c., and a plentiful supply of hot water for the bath; (c) intercurrent disease occurring, such as pneumonia, venereal, &c., a change of diagnosis not having been made, the disease remaining scabies. This not infrequently occurred in the early part of 1908 at Woolwich, and was corrected later, with good results, *vide* Appendix E.

(5) In large civil clinics in London, unguentum sulphuris or sulphur baths are ordinarily used in preference to balsam of Peru, merely on

account of the very much greater cheapness of the former. The utility of unguentum sulphuris, however, is held to be just as great as balsam of Peru, if "judiciously" used in the manner indicated in Appendix C.

(6) The duration of actual "contagiousness" of the ordinary run of itch cases, at Woolwich, is three days when treated by unguentum sulphuris according to instructions (Appendix C). I was formerly in the habit of giving a second course of three days in mild cases merely as a prophylactic, and to obviate any possible risk of the disease spreading in barracks. The test of cure is that all the "burrows" have gone—the itchy feeling may be merely a subjective symptom and, consequently, unreliable. There are rarely more than two men in hospital at the same time with scabies, and at present there are none in a garrison of 6,000 men. The essential point in the actual treatment of scabies is a "thorough" hot bath, twenty minutes, to soften the skin over the long burrow, where the animal parasite lives and deposits its eggs—then soft, or carbolic, soap is applied, followed by thorough rubbing with a rough towel to break up the burrows. Any parasiticide will suffice, such as unguentum sulphuris and balsam of Peru, and in mild cases, uncomplicated by secondary impetigo, eczema, or furunculosis, liquor calcis sulph. is better than either.

(7) Reinfection is ordinarily due to articles of infected clothing. The cases should, therefore, be kept under close observation on discharge from hospital, as this minimises relapses. There are cases of scabies, however, which may be admitted late in the course of the disease with complications, such as extensive secondary impetigo, eczema, &c. Such cases, in my experience, may require baths alone, or other remedies before unguentum sulphuris or balsam of Peru can safely be applied. This partly accounts for the long duration in hospital of certain cases in Appendices B and E, both under treatment with balsam of Peru or unguentum sulphuris.

INSTRUCTIONS FOR THE TREATMENT OF CASES OF SCABIES AS CARRIED OUT AT  
CAMBRIDGE HOSPITAL, ALDERSHOT.

Day of Admission	2nd Day	3rd Day	Diet and Extras Allowed	Remarks
To have hot bath (carbolic soap and nail-brush used) and immediately afterwards to be well rubbed over with the mixture of Balsam of Peru and Glycerine by an orderly.	Skin to rest. On no account should soap and water be used.	Repeat treatment similar to the first day if considered necessary by the Medical Officer. If further treatment not necessary, the patient to parade at the office at 12 noon for discharge the following day.	1st Day. Rations made into Beef Tea. 2nd Day. Beef Tea diet, afterwards ordinary diet. Oatmeal and sugar for Supper.	When using the Balsam of Peru the nail-brush on charge for that purpose should be used by the orderly. The Balsam of Peru (4 parts) and Glycerine (1 part) should be well shaken before being used.

## APPENDIX B.

Name	DATES OF		Number of Days under Treatment	Treatment	Remarks
	Admission	Discharge			
G.	11.6.09	25.6.09	15	<i>Balsam of Peru</i>	Very severe case, generalized; no complications; five lots of Balsam of Peru. Paraded in front of Officer in command of Surgical Division 23.6.09. Not fit for discharge.
B.	22.6.09	25.6.09	4	"	Mild case. Penis, abdomen and buttocks affected.
Y.	25.6.09	30.6.09	6	"	Moderate: no complications. Penis, abdomen and buttocks affected.
A.	29.6.09	3.7.09	5	"	Mild. Hands, wrists and legs affected.
C.	5.7.09	9.7.09	5	"	Penis, abdomen, thighs, buttock and wrists affected. Fairly severe.
K.	12.7.09	20.7.09	9	"	Moderate. Rash all over body and limbs. Cured 15.7.09, but not discharged owing to slight bronchitis.
B.	17.7.09	20.7.09	4	"	Mild.
A.	17.7.09	20.7.09	4	"	Mild.
L.	19.7.09	22.7.09	4	"	Mild.
D.	21.7.09	24.7.09	4	"	Mild.
E.	23.7.09	27.7.09	5	"	Mild.
E.	3.8.09	12.8.09	10	"	Relapse.
I.	5.8.09	10.8.09	6	"	Very mild.
C.	24.4.09	2.5.09	9	"	Very mild case. Penis and abdomen affected.
S.	7.5.09	18.5.09	12	"	Moderate. Tonsillitis.
S.	15.5.09	21.5.09	7	"	Moderate. In hospital with pneumonia. Two applications.
W.	20.5.09	4.6.09	16	"	Severe case, complicated with extensive secondary eczema.
A.	2.6.09	16.6.09	15	"	Moderate scabies, impetigo also, secondary to scabies.
G.	10.8.09	17.8.09	8	"	Mild.
E.	11.8.09	18.8.09	8	"	Mild.

APPENDIX C.

*(Posted in Ward.)*

INSTRUCTIONS FOR THE TREATMENT OF ITCH CASES BY UNGUENTUM  
SULPHURIS.

(1) After inspection by specialist officer, who decides if case is unfit for usual treatment, and whether it is really scabies, a *hot* bath is given on admission, under supervision of orderly.

(2) Orderly scrubs thoroughly with soft soap and nail-brush all over the body, particularly the back of the hands, inner sides of wrists, and between the fingers, or wherever the spots are, then dries the parts with rough towel to break up the burrows where the animal lives and lays its eggs.

(3) Unguentum sulphuris is applied once thoroughly, especially between fingers and on itchy parts, but not rubbed into the parts, as rubbing sets up eczema.

(4) A special ointment shirt and drawers is put on, and kept on day and night for three days.

(5) On the morning of the fourth day a hot bath with soft soap is given. The orderly and patient report to the medical officer on the morning of the fourth day—so that further orders may be given if necessary, after the case has been inspected.

(6) The kits and bedding are disinfected on admission, and a special report is made from the disinfecting chamber that this has been done. This is pinned on to the diet sheet. Reinfection usually occurs from the clothes. Any case in which the clothes are not brought for disinfection is reported to the administrative medical officer at once.

## APPENDIX E.

## CASES TREATED BY UNGUENTUM SULPHURIS, 1908.

Regiment	Rank	Name	Admitted	Discharged	Days in Hos- pital	Treatment	Remarks
R.H.A.	Dr.	S.	3.1.08	14.1.08	12	Ung. Sulph.	In the early part of this year cases of Impetigo Contagiosa, or Eczema, were quite frequently sent in as Scabies and erroneously diagnosed. In the latter half of 1908 I directed close attention to this point, prior to receipt of War Office letter of 5.4.09, and with favourable results as regards duration in hospital. I often gave a soldier a second or third course of Ung. Sulph. merely as a precautionary step.
A.S.C.	Boy	K.	6.1.08	28.1.08	23	"	
R.H.A.	Gr.	D.	6.1.08	28.1.08	23	"	
R.F.A.	"	J.	15.1.08	28.1.08	14	"	
A.S.C.	Dr.	T.	18.1.08	30.1.08	13	"	
"	"	L.	4.2.08	19.2.08	7	"	
D.C.L.I.	Bugr.	B.	11.2.08	18.2.08	18	"	
"	"	B.	24.2.08	27.2.08	4	"	
A.S.C.	Dr.	C.	5.3.08	14.3.08	10	"	
D.C.L.I.	Pte.	B.	10.3.08	21.3.08	12	"	
"	Boy	C.	6.3.08	10.3.08	5	"	
R.F.A.	Gr.	B.	17.3.08	7.4.08	22	"	
R.H.A.	Dr.	D.	23.3.08	26.3.08	4	"	
A.S.C.	Boy	C.	3.4.08	14.4.08	12	"	
D.C.L.I.	Pte.	W.	5.4.08	11.4.08	7	"	
R.H.A.	Dr.	S.	27.5.08	5.6.08	10	"	
A.S.C.	Sdr.	D.	28.5.08	3.6.08	7	"	
5th R.B.	Rfn.	P.	20.7.08	28.7.08	9	"	
D.C.L.I.	Pte.	P.	20.7.08	31.7.08	12	"	
"	"	W.	21.7.08	31.7.08	11	"	
R.H.A.	Dr.	B.	1.9.08	8.9.08	8	"	
5th R.B.	Rfn.	B.	3.9.08	8.9.08	6	"	
R.G.A.	Boy	R.	12.9.08	17.9.08	6	"	
R.F.A.	Dr.	W.	15.9.08	22.9.08	8	"	
"	S.Sm.	A.	18.9.08	25.9.08	8	"	
5th R.B.	Rfn.	S.	17.9.08	29.9.08	13	"	
A.S.C.	S.Sm.	B.	16.9.08	24.9.08	9	"	
R.F.A.	Gr.	B.	17.9.08	24.9.08	8	"	
"	Dr.	J.	19.9.08	22.9.08	4	"	
"	"	C.	19.9.08	22.9.08	4	"	
"	"	C.	19.9.08	25.9.08	7	"	
"	"	M.	21.9.08	24.9.08	4	"	
5th R.B.	Rfn.	L.	21.9.08	24.9.08	4	"	
R.F.A.	Gr.	T.	28.9.08	6.10.08	9	"	
A.S.C.	Dr.	F.	7.10.08	14.10.08	8	"	
R.F.A.	Gr.	W.	8.10.08	31.10.08	24	"	
R.G.A.	"	T.	8.10.08	14.10.08	7	"	
R.F.A.	Dr.	T.	21.10.08	31.10.08	11	"	
R.H.A.	Gr.	L.	28.10.08	4.11.08	7	"	
5th R.B.	Rfn.	C.	29.10.08	3.11.08	6	"	
"	"	C.	5.11.08	10.11.08	6	"	
R.H.A.	Dr.	S.	10.11.08	17.11.08	8	"	
"	Gr.	S.	10.11.08	17.11.08	8	"	
5th R.B.	Rfn.	O.	10.11.08	16.11.08	7	"	
"	"	D.	10.11.08	17.11.08	8	"	
A.O.C.	Pte.	A.	30.11.08	8.12.08	9	"	
R.F.A.	Gr.	P.	4.12.08	10.12.08	7	"	
5th R.B.	Rfn.	J.	5.12.08	12.12.08	8	"	

## ENTERIC FEVER IN INDIA—A PROBABLE FACTOR.

MAJOR M. P. CORKERY.  
*Royal Army Medical Corps.*

OWING to the absence on leave of the officer in charge of the Jubbulpore Brigade Laboratory, I was asked by Colonel S. C. B. Robinson, Principal Medical Officer of the Jubbulpore and Jhansi Brigades, to enquire into the continued prevalence of enteric fever in Jubbulpore, during the months of February, March, April and May of this year.

A total of fourteen cases had occurred amongst the British troops, the first being admitted into hospital on February 15th, and the last on May 5th; the cases occurred at different intervals during this period, showing that the cause or causes were in existence the whole time. The British troops in Jubbulpore comprise one battalion of Infantry (60th Rifles) and a brigade of Field Artillery, three batteries with an ammunition column. Of the fourteen cases, eight occurred amongst the infantry, and six amongst the artillery. No cases occurred among the married people or the members of the serjeants' messes.

The unmarried men of the 60th Rifles occupy thirteen barrack-rooms; of their eight cases no two came from the same building; the Royal Artillery occupy eleven barrack-rooms and their six cases came from four separate rooms.

The *water supply* to the troops is piped, from a source some ten miles off. I was informed that the water had recently been analysed and found pure enough to render boiling unnecessary. The same water was supplied to the European community, amongst whom no cases of enteric fever had occurred.

The *milk supply* is from the Government Dairy Farm, which is up-to-date and well appointed and is stringently supervised by the Senior Medical Officer, Lieutenant-Colonel Geddes, R.A.M.C.

Neither the milk nor the water could reasonably be held to be responsible for the enteric fever.

I made the stereotyped inspections of the different lines during the *morning hours*, and as my visits were anticipated very little information was gained. However, the Artillery lines were noticed to be distinctly overcrowded; the ground is limited, with the result that the barrack-rooms, with their accompanying cook-houses, latrines, urinals, &c., are too close to each other. The horse lines and native followers' lines are sandwiched in between the Artillery and Infantry lines and are cramped and crowded, and too near the artillery barrack-rooms. The coffee shop and R.A.T.A. rooms of the artillery were not as clean as they might have been, flies were plentiful, some of the native servants dirty, and the "washing up" arrangements were not satisfactory.

On the other hand, the 60th Rifles' institutes were well looked after, but in spite of this flies were present, though to a less degree. Their



lines are not unduly crowded and they are fortunate in the possession of an intelligent and trustworthy sanitary corporal. The general sanitary condition of their lines was much superior to that of the Artillery; but yet, proportionately to their strength, they were almost as severely attacked.

Crude carbolic acid was in use by both units for the latrine pans. Not being able to discover any definite incriminating agent, I decided to visit the lines *in the evening* with a view to seeing things as they existed out of inspection hours, paying particular attention to the institutes, urinals, and latrines. The institutes I found to be very largely patronised; the food supplied was good and cleanly served, but flies were fairly numerous before dark.

After dark, the urinals and latrines were in total darkness and no attempt was made to show where they are located. I found almost every pan in the various latrines had been used and remained unemptied and uncovered. One four-seated latrine situated only a few yards from the Artillery coffee shop, and consequently much used by the men, had its pans practically full of excreta; there was a most offensive smell, and—just before sunset—flies were numerous. The latrine nearest to the coffee shop of the British infantry was similarly largely used and in much the same state. In the few pans I found unused, no disinfectant fluid had been placed, and no doubt the same state of things existed in the used pans.

*I did not see a single sweeper or sanitary orderly during the whole of my evening tours.* It appears that the sweepers work from *réveillé* to 5.30 p.m., so that from this hour to *réveillé* next morning sanitation is not existent.

We here find all the conditions required for the spread of enteric fever: (1) The infected person in the form of the enteric carrier (as there are over fifty recovered enteric cases amongst the British troops in Jubbulpore, a few of these are almost sure to be carriers). (2) The infected material, in the form of the fresh and undisinfected excreta, or urine of one of the infected persons, who chances to use the latrines after 5.30 p.m. (3) The presence of numerous flies in the coffee shops and the adjacent latrines. (4) The susceptible individual (no less than thirteen of the fourteen cases were uninoculated against enteric fever, the fourteenth having had only one dose).

That this cessation of sanitary measures between 5.30 p.m. and *réveillé* exists in the great majority, if not every, station in India, is very probable. Experienced medical and regimental officers to whom I have spoken on the subject agree with me on this point. However, there can be no two opinions that, where it does exist this insanitary procedure should be at once altered. It will be interesting to note if there is any reduction in the number of cases of enteric fever in cantonments, when

the sanitary measures usually adopted by day are also adopted at night, or at least till "Lights out."

The following were the chief recommendations made to meet the case in Jubbulpore:—

(1) That the latrines and urinals used at night, particularly those adjacent to the institutes, be supplied with lights till "Lights out."

(2) That till "Lights out" arrangements be made to empty the pans as in the daytime—there is no necessity to remove the night soil to the trenches after dark, so long as it is placed in the covered iron receptacles, with a plentiful supply of disinfectant fluid.

(3) That saponified cresol ( $\frac{1}{4}$  ounce to the gallon) be used in the latrine pans, and that sufficient fluid be placed in them to allow it to stand at least 1 inch deep.

(4) That a sanitary orderly, or other responsible individual, make an inspection of all the latrines at "Gun fire" and see that the pans are clean and filled with a double supply of disinfectant fluid for the night.

To carry out these recommendations it will be necessary, either to employ extra sweepers, or to place some of the present staff on night duty. Extra expenditure no doubt will be incurred, but this, to my mind, is a minor matter compared to the advantages gained. I cannot help thinking that given the grave sanitary defects described above we can never hope to eradicate enteric fever from cantonments in India.

It is interesting to note that no further cases of enteric fever have occurred in Jubbulpore since the above defects were remedied, nearly three months ago.

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## Reviews.

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**ASEPTIC SURGERY.** By Charles Barrett Lockwood, F.R.C.S., Surgeon to St. Bartholomew's Hospital. London: Henry Frowde, Hodder and Stoughton, Oxford University Press, Warwick Square, E.C., 1909. Pp. xii. + 275. Price 5s. net.

We welcome with great pleasure the third edition of this useful little book, the second edition of which was published ten years ago. Whilst the principles upon which aseptic surgery is founded cannot alter, the manner of their application has undergone in those ten years many changes making for improvement and simplicity. Those who have read the previous editions of the book will notice this.

The importance of bacteriology in surgery is rightly laid great stress upon, it being pointed out that it is as important in this science as anatomy, physiology, and pathology.

The writer in the chapters on the bacteria of wounds enters succinctly, but quite sufficiently for the purpose, into the characteristics of the commonest micro-organisms, remarking, very truly, that "where accumulations

of knowledge have become so great a helping hand is needed, lest time be wasted in needless labour." Many, we are sure, will appreciate this with thankful hearts.

The chapter devoted to the sources of infection is lucidly written, and the various paths are clearly explained. We quite concur in the statement on p. 111: "The judicious use of antiseptics is a safeguard and essential in our older hospitals, and with our educational system of house surgeons and dressers."

The writer wisely points out that in testing the efficiency of disinfectants it is not right to expect that they will be as efficient in practice as they seem in the laboratory, especially when the tests are done with bacteria grown artificially.

An excellent account is given of the antiseptics in common use, biniodide of mercury (the formula of which, by the way, is not quite correctly given in the footnote on p. 147) being considered the most efficient.

On p. 168 it is stated that normal saline solution is made by boiling 30 grains of common salt in a pint of water; this is too weak, the best strength for this fluid being 80 grains sodium chloride to the pint. Under the heading of the removal of sutures (p. 232) it is stated it is unnecessary and undesirable to apply lotions to wounds before cutting and withdrawing the sutures. This is not quite in keeping with the interesting remarks on p. 99 in reference to the numerous cocci and bacilli which are contained in sweat and sebaceous matter, even after thorough cleansing of the skin. The chapter on surgical technique would be difficult, if not impossible, to beat.

Chapter xix., the closing one, gives a short, instructive *résumé* of the results to be gained by careful attention to the details of aseptic methods, and the history of surgery is sufficiently entered into to show what benefits have accrued from the faithful observance of these methods. We should strongly advise all medical men, senior students, and nurses to read this book, which, while being sufficient for practical purposes, gives numerous references for those who may wish to study the subject more extensively.

C. B. L.

**THE MORPHIA HABIT, AND ITS VOLUNTARY RENUNCIATION.** (A PERSONAL RELATION OF A SUPPRESSION AFTER TWENTY-FIVE YEARS' ADDICTION). By Oscar Jennings, M.D., Paris. Baillière, Tindall and Cox. Demy 8vo, pp. x. + 492. Price 7s. 6d. net.

This book is a veritable collection of human documents, dealing with a subject which is fortunately but very rarely met with in the Service. The statements made rather startle one, *e.g.*, the author tells us in the preface, "That one medical man out of four is a drug *habitué*, usually a morphinist." It is almost impossible to believe that this statement can apply, at all events, to British medical practitioners.

And again it is stated "that one-fifth of the mortality in the profession is said to be caused by morphinism." We quite agree with the author as to the indifferent attitude assumed by practitioners in this country to the thoughtful treatment of the morphinist, who is too often regarded as an example of moral obliquity, an individual who does not come within the range of *Materia Medica*.

Throughout the book a series of cases is given *in extenso*, some complicated with the abuse of other drugs, cocaine, &c., and others in which the presence of organic disease necessitated the modification of treatment. The author's method in each case is given in careful detail, and the results obtained were most satisfactory. He contrasts his mode of treatment with that adopted in a sanatorium in France and Germany respectively, the differences in the results being most convincingly in favour of the author's method of treatment. Throughout the book the principle of "voluntary renunciation," as opposed to "suppression," is emphasised; alkalies in the form of bicarbonate of soda, or mineral waters (*e.g.*, Vichy water), together with cardiac tonics, digitalin, shartein, &c., being given. To relieve the craving arising from the reduction of morphia, the use of other sedatives, hyoscine, &c., was cautiously adopted.

The importance of after-treatment on the abandonment of the drug is fully gone into, especially as regards dieting, the use of alcohol, tobacco, and suitable exercise. The neglect of due regulation with regard to the latter may lead, as the author demonstrates, to a relapse into the original habit.

The book is a most interesting one, and would be of great value to any physician to whose lot it might fall to treat individuals who had fallen into this pernicious habit.

It is the record of a physician who has had a very large personal experience of the successful treatment of a condition which unfortunately has been too often regarded as being outside the possibility of reasonable cure, and has in consequence of this professional attitude opened a field for the incursion of the "patent medicine" advertiser, to prey on the credulity of unfortunate sufferers from the morphia habit.

F. M. M.

THE INFLUENCE OF HEREDITY ON DISEASE, WITH SPECIAL REFERENCE TO TUBERCULOSIS, CANCER, AND DISEASES OF THE NERVOUS SYSTEM.  
London: Longmans, Green, and Co., 1909. 4to, pp. xii. + 142.  
Price 4s. 6d. net.

This is a reprint from the *Proceedings of the Royal Society of Medicine*, vol. ii., 1909, of the report of a discussion in November and December, 1908, on the subjects indicated by the title, a discussion opened by Sir William Church, and continued by the leaders of the profession, two biologists (Professor Bateson and Mr. Mudge), and by Professor Karl Pearson.

It is, of course, impossible to do more than indicate the drift of the discussion. Sir William Church in his opening address pointed out that no disease arising from or associated with the presence of a foreign body, *i.e.*, that no disease caused by a micro-organism, can be considered as hereditary, though it may be that certain strains are, according to the experience of stock breeders, more susceptible to infection than others. This last point was, however, contradicted by Sir John McFadyean as regards the supposed greater susceptibility to bovine tuberculosis of certain breeds of cattle; in his experience, when the environment is the same, in this country all breeds have the same degree of susceptibility. Dr. Arthur Latham in his address also concluded that the theory of an inherited predisposition to tubercular infection is based on insufficient

evidence. Dr. Shrubbsall, whose address was illustrated by a number of interesting tables, finds very little effect on the offspring of parental tuberculosis.

The second class of disease referred to by Sir William Church includes all those due to "inborn errors of metabolism," using Dr. Garrod's phrase, in which the faulty chemistry is not due to sufficient oxidation alone, but to the changes in the action of the various enzymes now known to have general as well local effects in the body. These include such diseases as cystinuria, alkaptonuria, and albinism, where there is some evidence of a family tendency, while in gout and diabetes the hereditary influence seems distinct.

Sir William Gowers pointed out that in certain classes of nervous disease, heredity seems well marked. In one important group, termed by him the early abiotrophies, certain systems of structure have an essential defect of vital endurance in consequence of which their life slowly fails. These diseases range from the well-marked but insignificant early and extensive baldness to such as hereditary optic atrophy, hereditary ataxy (Friedreich's disease) and pseudo-hypertrophic paralysis: in the last transmission is limited to the female, who is rarely herself affected. The other abiotrophies follow the same course, only transmitted on the maternal side, and usually limited to males.

A second class, arising after the period of growth is over, presents persistent disturbance of function, and is commonly hereditary, but may be transmitted by either side. Such diseases are the heredo-ataxy of Marie—Huntingdon's chorea—Thomsen's disease. Again in a third class heredity is operative, the so-called functional affections; some of these, as hysteria and neurasthenia, vary enormously and cannot be correlated with family diseases. Two forms have, however, been specially studied in this relation, epilepsy and insanity. Sir William Gowers places all cases of epilepsy due to organic lesions, disease, or trauma of the brain, on one side as having in them no hereditary element. As regards the remaining cases, he limited his enquiries to the two diseases, epilepsy and insanity in antecedents or present and past collaterals. In private cases (600), he obtained a history in 47 per cent., which he believes to represent in fact 50 per cent., or even more. Among hospital patients, for obvious reasons, the percentage fell to 35 per cent., "so great a difference does ignorance make."

Dr. Mott is at present collecting material which so far shows a gradually increasing number of relatives of his patients who are confined in other asylums, a fact of considerable importance in connection with the hypothesis of heredity as a determining factor. He, however, states that "as a rule no particular form of insanity is hereditarily transmissible, but only a tendency to mental instability," which may manifest itself in various ways.

Dr. Savage believes "strongly in the power of transmitting from parent to offspring tendencies to mental disorder, but that the transmission is rarely what might be termed true." "That is, it is not common for the same form of mental disorder to reappear in both parent and child." Certain types appear to him to owe more than others to hereditary predisposition.

Dr. Bashford shows, as regards cancer, that it is so frequent a cause of death over 35 that care has to be exercised in forming an opinion,

and that as a matter of fact, the 4,256 parents of 2,263 cancer patients suffered only in the same proportion as the general population, that is, there is no selection. Further, in 358 out of 669 cancer patients it was definitely stated that no case of cancer has occurred in the family, while in the remaining 311 cancer cases of the same group cancer was recorded in 1 to 4 of the blood relations. Taking, then, the group of 669 cancer cases, the incidence of cancer in the parents of the cancer cases was that of the general population. Exceptionally, cases of persistently high incidence in certain families do occur, but with regard to the great frequency of the disease, these are probably the result of a chance distribution. "There is, in short, no evidence of cancer arising as a transmissible variation. It seems then that cancer is probably always acquired."

Mr. Butlin agreed that, if anything is inherited, it is only a susceptibility to cancer.

Two things appear important in any discussion on this subject, Sir William Gowers' remark that "we are only in the stage of random observation," and Sir William Church's distinction between diseases due to micro-organisms and those due to errors in metabolism, which may include Sir William Gowers' abiotrophies. It is not impossible that, as our knowledge of the actual causation increases, certain diseases, believed to be hereditarily transmitted, will be shown to be in fact due to infection.

In addition to the professional aspect of the question, there is an interesting exposition of elements of Mendelism by Professor Bateson, supported later by Mr. Mudge, and indeed throughout the volume are numerous references to the special diseases now being examined in this relation, colour blindness, albinism, and many others. All of these are exceedingly interesting in themselves, as examples of the application of a new method, and one may add, as materials for controversy, which is not wanting. Quite apart from the intrinsic merits of the question, there is little doubt that that portion of the discussion which had the greatest effect on the audience was the address by Professor Pearson, an example of clear thinking and lucid explanation.

No one should be deterred from buying or at least reading this book by the idea that it is theoretical and difficult. The addresses of those who took part in the discussion are, for the most part, valuable summaries of the present-day knowledge of the conditions affecting the transmission of the diseases discussed.

R. J. S. S.

THE "TIMES" HISTORY OF THE WAR IN SOUTH AFRICA. Vol. vi. London : Sampson Low and Co., 1909.

This, the concluding volume of the important history of the South African War, edited by Mr. L. S. Amery, is divisible into two entirely distinct parts, one almost entirely political, the other "a series of special chapters on the more important technical and administrative aspects of the war." The first, the political section, is of the greatest interest to those who have some acquaintance with the tribulations of South Africa in its unfortunate history from the time of first occupation ; the second, technical portion, is, however, what we have to deal with here. The chapters of which it is composed were written by officers possessing special knowledge of the departments dealt with, but they have been

freely edited by Mr. Amery, and "are in no sense to be regarded as an exposition of purely official views."

These technical chapters include: the mobilisation and improvisation of the South African Field Force, the sea transport of the Army, the railway work in the war, the engineer work, supply and transport, remounts, work of the Army Ordnance Department, armament and employment of the artillery, the Medical Services during the war, and three chapters dealing with martial law, military administration of occupied territory, and finance. Of these, it may be said that they form an extremely valuable and instructive commentary on the work of those very important services which normally appear less before the public eye than the three great arms of the Service. Much use appears to have been made in their preparation of that mine of information concerning the inner working of the Army, the Report of the Royal Commission on the War in South Africa; they are therefore useful as a summary of that important document, with the addition of material not found therein. Most of us will naturally turn to the chapter on the Medical Services first of all, but the other chapters should not be neglected by anyone who wishes to understand the actual working of the war machine, a knowledge that hardly anyone can acquire without such assistance as this volume affords.

As regards the chapter on the Medical Services, it may be said at once that it gives the fairest account of our work in South Africa that has been issued from any public press. The difficulties are recognised and the steps taken to meet them; deficiencies, defects, and errors are pointed out, but temperately and with judgment. Those who are without personal experience, but who wish to know the difficulties with which the Medical Service had to contend before the war, will find them briefly and sympathetically stated on pp. 479-511.

After this introductory matter, comes a very useful condensed account of the work of the Medical Service, including that of all the auxiliary Medical and Nursing Services, in which much use appears to have been made of the official report on the medical arrangements in South Africa. No mention is made "of the individual work of the officers, men, and nursing sisters of the Medical Services. They gained for themselves in all quarters a fully deserved reputation for courage and devotion to duty." During the earlier part of the war "the undoubted success with which the Medical Service dealt with its task, added to the splendid gallantry shown by its officers and men on the battlefield, impressed not only the ordinary correspondent but men of the highest professional attainments." One may place this appreciation alongside the remarks on the Medical Service in the first volume of the German Staff account of the war.

But all is not milk and honey: the defects of the hospitals on the line of communications became more evident, with the result which we all know. We regret that there was some foundation for the "impassioned invective," we deplore the method, but we have reason to be grateful for the results which have followed, "a series of reforms of the first importance." The position which originated these reforms is discussed temperately, and the conclusion is best indicated by the rubric: "The hardships possibly exaggerated but not wholly unavoidable."

One point might be taken exception to. The improvement of the hospital system in the middle of 1900 was due mainly to greater facilities for transport, giving power of expansion and improvements in equipment.

These were the main factors; subsidiary elements, changes in personnel, and the like, may have been stimulated by our unpleasant experience, but the great improvements, which began about that time and continued till the hospitals were no longer needed, were initiated within the Service, and not by the stimulus of the Commission. Altogether this is a volume which should be found in every library.

R. J. S. S.

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## Reprint.

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### ADDRESS OF THE PRESIDENT OF THE ASSOCIATION OF MILITARY SURGEONS OF THE UNITED STATES, EIGHTEENTH ANNUAL MEETING, WASHINGTON, D.C.

ON this occasion of the formal opening of our Congress, which the Honourable Hannis Taylor has so eloquently initiated, it gives me great pleasure, on behalf of the Association, to acknowledge the kind welcome which has been so gracefully offered by the representative of the District Commission, Hon. Henry B. F. Macfarland, and the member of the medical fraternity of the District of Columbia, Dr. S. S. Adams. I hold it a peculiar privilege also—not only as President of the Association, but as a long resident of Washington—to extend a heartfelt greeting to all delegates—to felicitate them, and those who accompany them, upon the opportunity to visit this beautiful city and enjoy its hospitality, and to rejoice in the circumstance which has brought us together in a renewal of old acquaintance and to hold conference on subjects of prime importance.

The interests of the Association of Military Surgeons embrace the physical efficiency of military and naval organisations, the efficiency of the medical profession as regards each of its manifold responsibilities in military spheres of activity, the honour of nations, and the welfare of humanity. No organisation is more widely representative of the vital concerns of the human race, and, owing to its intimate identification with the great physical emergencies of life and nations, the deliberations of those gathered here under such a bond of fellowship deserve to be fruitful.

We unite this evening literally “from the four corners of the earth,” and no one element of our constituency is devoid of those laurels, the reward for contributions to material progress, which bespeak an earnest ambition for the purpose of this meeting and give substantial promise of profitable results. The central Government of the United States is represented through three national organisations—the Army, the Navy, and the Public Health and Marine Hospital Service, including members of the Medical Reserve, National Guard and Naval Militia; and all the civilised countries of the world are represented, either by selected delegates or in spirit. I think I may safely say that each one of these



countries not represented in the person of an officer extends wishes of supreme goodwill and entertains an appreciation of the work that claims our attention. The consciousness of this moral support of our aims must be a source of gratification to us all, and the Association is the recipient of many expressions which give tangible evidence of the broad interest which exists. We entertain feelings of deep gratitude to those countries which have honoured the Association and enhanced the capabilities of this Eighteenth Annual Meeting by sending delegates; and just here I desire, as President of the Association of Military Surgeons, and on its behalf, to address a few special words of welcome to the foreign representatives who are our distinguished guests. It is happily not an unfamiliar experience to find you in our midst. Each year for many past these meetings have been attended by members of the Medical Corps of the armies and navies of great nations. From the very first occasion of the participation of foreign countries we have been sensible of the honour conferred and appreciative of the manifest disposition to co-operate for the common good, but as time has passed this recurring intercourse has developed an enduring tie of personal and service friendship between us, and we welcome you, who have come so far from different directions—both because of an affectionate, fraternal regard and because of that growing feeling of international comity, through which military medicine hopes to take its rightful place as an important factor in national strength.

The history of the organisation dates from the year 1891, when on September 1st, at the instance of the late Nicholas Senn, some fifty members of the National Guard of the United States met in Chicago, Illinois, with the object of instituting an "Association of Military Surgeons of the National Guard for the Advancement of Military and Accidental Surgery and all things pertaining to the Health and Welfare of the Civilian Soldiers." From this small but earnest gathering of medical men has evolved the Association of Military Surgeons of to-day. In 1893 the affiliation of the Army, Navy, and Public Health and Marine Hospital Service was invited, representatives of these services being in attendance at the meetings of that year, and the name and constitution and bye-laws of the Association were changed to make such affiliation possible and acceptable. The object of the Association was re-stated to be ". . . to increase the efficiency of the medical services of the Army, Navy, the Public Health and Marine Hospital Service, and of the Militia of the different States, by mutual association and the consideration of matters pertaining to the medico-military service of the United States, both in peace and in war." Such a mission seemed at that time to be sufficiently broad in scope to satisfy the ambitions for utmost usefulness—yet but a year later steps were taken to increase the value of the Association's councils by the participation of delegates from foreign countries. The success which attended the efforts in this direction may be judged by the fact that we have with us this year distinguished repre-

sentatives from Great Britain, Canada, Germany, France, Italy, The Netherlands, Mexico, Colombia, Ecuador, Honduras, Guatemala, Peru, Japan and China. Thus our aim to increase the efficiency of medical services extends far beyond the boundaries of these United States. With this comprehensive purpose as a guide, the Association is completing its eighteenth year of that prosperity and usefulness which Colonel B. J. D. Irwin, Medical Department, United States Army, predicted in his remarks to the charter members, on the occasion of their meeting in Chicago.

There is an essential unity in singleness of purpose of all medico-military establishments and all are in common need of enlightenment upon the newest ideas and most approved methods pertaining to the duties which properly devolve upon them in peace and in war. Each one must share in every step of progress toward highest efficiency—first in effective preventive measures (sanitary and hygienic), and then in the various problems relative to the care of the sick and succour of the wounded as applicable under the peculiar and changing conditions of Army and Navy service, including schemes of organisation, character of equipment, methods of transportation, questions of reserve stores, plans of improvisation, sources of assistance available in emergency expansion, and the manner of its affiliation with the regular services in time of war. The Association of Military Surgeons, in annual convention, as far as I am advised, alone affords opportunity for the international discussion of these several purely medico-military subjects. The original reformulated object of the Association epitomises the work of the past and indicates the line of work for the future. We must not permit ourselves to stray from this definite programme. It embraces enough to keep us fully occupied if best results are to be accomplished. There is a growing importance that each officer take part in the movement toward improvement in every direction where the slightest improvement is possible, and an exacting obligation rests upon all to communicate such observations, discoveries, inventions and ideas as are calculated to strengthen our hands and enlarge our resources in the discharge of that sacred responsibility reposed in us—especially in the crisis of war, when medical service is in greatest demand and its capabilities are put to the severest test. To have conceived an idea, to have profited by an experience, or to have conducted an investigation bearing upon the advance of medico-military science entails the ethical requirement that the knowledge gained be promptly communicated for the benefit of all who may be interested in or helped by the information. In order that our studies may be properly directed, the discussion at each annual meeting should serve to develop and suggest the subjects it would be most profitable to consider at the next. And, moreover, acting upon such a guide, the programme should be tentatively cast well in advance, so that all may clearly understand the general character of papers desired, and the line of thought, preparatory to discussion, which the Association regards as

of most importance to the elucidation of troublesome questions and the perfection of methods and resources. It has been well said by Major (now Lieutenant-Colonel) Charles F. Mason, that "In time of war there are always two armies in the field—the effective army and the great army of non-effectives, the sick and wounded; the functions of the Medical Department are to constantly strive to add to the number of the effective at the expense of the non-effective, and to take entire charge of the latter so as to relieve the line of their care." Nothing satisfactory to this end can be accomplished unless due preparation has been made in times of peace, and it is courting disaster to neglect any consideration which will enable medical services to carry out those measures which, in their scientific judgment, are believed to be necessary to insure military prosperity.

I feel impelled just here to reiterate and emphasise the importance of vesting an adequate range and degree of authority in the medical services as a pre-requisite to success in their functions. They should have direct and full charge of all matters and provisions pertaining to their work, including the *personnel* of the medical department, hospitals, hospital ships, &c., and they should have power and means, subject only to the final authorisation of commanding officers, to execute the plans for proposed sanitary improvements.

"The remarkable success of the Japanese in preventing disease in their armies during their late war with Russia must be attributed, in large measure, to the fact that they accepted as a fact that their medical officers possessed superior knowledge of sanitary matters, and that, having employed them as specialists in that line, they accepted their advice without question, gave them the men, material and money to carry out their suggestions, and held them responsible for results."

If medical services are to be held accountable, as they should, for the consequences of their work, the special training of medical officers must be recognised, and they must be given proper authority within their legitimate field of operation. We can afford no hesitancy in the contention for this principle, and those represented by this organisation should be strongly supported in their work by everyone interested in the welfare of the men who are devoting their lives to the service of their country and upon whose health the efficiency of armies, navies and nations depends.

I have tried to outline our primary duty as an association, but on the component divisions of the organisation and on the individual members of those divisions rests an obligation distinct from (but allied to) the purely medico-military purposes of the Association. The superior opportunities of medical men, in military and naval service, for the observation and study of types and forms of disease in every part of the world, gives the profession a right to expect from us valuable contributions to exact knowledge on many unfamiliar diseases, and on the effects of geographical positions and climate in modifying the character of those better known.

Moreover, medical officers of military establishments come in such extensive and close contact with the young manhood of nations that, as the *Lancet* puts it, “. . . their fingers are literally on the pulse of the public health and their collective investigations should go far to solve some of the most difficult problems of our time.” There is need, therefore, that medical officers of the services should not neglect the professional privileges of their positions and wide travel, and that they employ them to the advantage of medical science in general and their associated colleagues in particular. The Association of Military Surgeons, by means of its meetings and through the agency of its Journal, very naturally lends itself to the discussion and dissemination of such information, which must assuredly be in harmony with accepted aims to take cognisance of all that is of interest and which makes for efficiency in medico-military circles. We desire the medical world to look upon this growing association of medical officers as a body of highly trained organised observers and, whether or not the facilities which it offers are utilised as the medium for the announcement of advanced knowledge relating to these subjects, the Association must inevitably play an important rôle in fostering and encouraging original research and independent thought and action.

With reference to the Journal of the Association, I desire to invite the attention of the members to the perplexing question of advertisements. I use the term “perplexing” only in connection with the experienced difficulties in securing the proper sort of advertisements, and the Journal's present regrettable need of them as a support of its publication. There should be nothing perplexing in the Association's attitude toward them as entirely out of keeping with the cherished ambition for the high ethical standard of our Journal, and I believe I am expressing the sentiments of all when I say that the time has come when its dignity should be enhanced and maintained by relieving it of any dependence upon advertising matter. I trust that the Association will give deserved consideration to this question and make provisions in accordance with this need.

The policy which has animated the administration of the Association during the past year may be expressed in the alliteration—economy, efficiency and enthusiasm.

Conscientious watchfulness over the finances has been exercised and partially successful effort has been made to order the business concerns of the organisation on a sound basis. The establishment of headquarters in Washington has, by bringing the President and Secretary in closer touch, aided reform in this direction, but it still remains to complete the administrative organisation of headquarters by transferring the office of Treasurer, at least, to the immediate neighbourhood of the Secretary's office, if not by amalgamating it with that of the Secretary. And just here I desire to say that the regrettable illness and absence at this meeting of the Association of its Treasurer emphasises what I have said on this subject.

## 700 *Address of the President of the Association of Surgeons*

Major Arnold has been a most efficient officer, zealous and ever ready to advance the best interests of the Association, and I hope and believe that he will join heartily in any reform which may be considered for the best interests of the Association as a whole.

The increased efficiency and broader usefulness of the Association in fulfilling its purposes have claimed the earnest consideration of all officers, and some success has rewarded the effort to improve the Journal and enlarge the membership. It is a matter for gratification, also, that the stability of the Association is being more and more fortified by an awakening enthusiasm as well as by a substantial growth in the numerical strength, and an increasing active interest is being aroused on all sides.

In certain respects the past year has been unusual, and it is unfortunately marked by an event which not only operates to embarrass the full realisation of admittedly necessary reforms, but to bring sorrow to the hearts of all who enjoyed the privilege and pleasure of an acquaintance with our former Secretary and Editor, Major James Evelyn Pilcher. Major Pilcher's resignation is deeply regretted, both as a great loss to the Association and as an expression of the failing health which made it necessary. This officer is credited with the distinction of originating the idea of the Journal and demonstrating its feasibility, and he will ever be remembered with affection and esteem as the guiding spirit and force in the Association's evolution through a long period of abundant prosperity. It would be presumptuous for me to attempt to add to the words of sincere appreciation and gratitude so gracefully framed by the resolution committee of the Executive Council, or to the eloquent eulogium by Major Pilcher's closest associate and valued assistant, William H. Ames. Suffice it to say that his exceptional abilities will be as greatly missed, now that he has severed his official connection with the Association, as they were appreciated during his long and faithful service in every direction during his secretariat and editorship. The appropriateness of some further sign of that respect, gratitude and sympathy felt for Major Pilcher, and of confidence in his accomplished and widely experienced successor, Major Charles Lynch, and his able and zealous assistant, Surgeon William H. Bell, is of course apparent to this assemblage.

It has been many years since the organisation met in Washington, and in view of all that this City represents as the headquarters of everything military, and in view, moreover, of the growing international character of the Association of Military Surgeons, it would seem not only desirable but highly proper that the national capital should be the adopted home and place of meeting as far as possible in the future. The idea is suggested for the consideration of the Association, and it is believed to be deserving of careful thought, more especially as it would insure a larger attendance, and would offer the strong probability that greater effectiveness would attend the expressed opinions as to the needs of the

medical services, which develop in the course of discussion during such conventions as this.

The potentiality of usefulness which this organisation represents can not be overestimated, and in concluding this trespass upon your patience I beg to express the earnest wish that the conference upon which we have now entered may be marked by the utmost success in point of both professional accomplishments and social enjoyment. The Association extends the most cordial invitation to foreign delegates and other guests to participate in all discussions, and it respectfully solicits a free expression of their judgment upon the various subjects before us, and such information as they may feel at liberty to give with regard to methods and practices in vogue in their respective countries. I hope that every member of this Association, individually and collectively, will do his utmost to make this Eighteenth Annual Meeting one to be remembered for the good it has accomplished.

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## Current Literature.

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**A New Field Operating Table for the German Army.**—A field operating table is supplied to the German Army in the proportion of two for each bearer company, one for each hospital train, and twelve for each advanced depôt of medical stores. Field hospitals do not carry operating tables, but would draw one if necessary from the advanced depôt.

The existing German pattern of table is made of wood, but for many years improvements have been under consideration, and a table has now been constructed, with the co-operation of several army medical officers, by the Medizinisches Warenhaus, Berlin. It is not patented, and will gradually replace the old operating table in the units mentioned above.

A description of the new table is given in the *Deutsche Militärärztliche Zeitschrift* of August 22nd, 1909, by Stabsarzt Dr. G. Schmidt. It is very similar in general construction to Haga's operating table, used by the Japanese in Manchuria and illustrated on p. 373 of the Medical and Sanitary Reports of the Russo-Japanese War. It is made of metal (galvanised iron and steel). Its weight is about 55lb. (25 kilogrammes), and the price for the most expensive make £6 10s. Apparently a cheaper price or make is intended.

W. G. M.

**The Ambulance Dog in Morocco** (article by Dr. Granjux).—The article begins by stating that Major Richardson resigned his commission in order to undertake the management of the police dogs in London. It also refers to a Spanish journal as saying that in the Russo-Japanese War numbers of lives which would otherwise have been lost were saved by means of these dogs. The Spanish journal further states that Major Richardson went to Spain, taking his trained bitch "Joyful," and was received at San Sebastian by Queen Victoria, who approved of his wish to

proceed to Melilla and assist in the search for wounded and missing. With the Royal approval he speedily obtained the necessary permit, and will shortly embark from Malaga with a Captain of the Artillery, appointed to accompany him. The writer then proceeds to discuss the results which may be expected from this trial, and says, that they are certain to be poor.

According to the Spanish paper, these dogs (bloodhounds) are descendants of those which Christopher Columbus took with him to America. These dogs hunt by scent, and are therefore adapted to police requirements. But in the case of searching for wounded scent is of no use; what is required is a systematic examination of any particular area which the dog's master may point out.

Dr. Granjux states that many trials were made recently in France, both by night and day, in the broken country in the Forest of Fontainebleau, accounts of some of which have already been communicated to the general press. These trials have confirmed his former opinion that one cannot be certain that a district has been thoroughly searched by dogs unless they have methodically examined the whole of the area, working up wind, and for this purpose a dog trained to track by scent is not suitable.

C. E. P.

**Drinking Water in the Italian Army.**—(Médecin Major François Testi, Professor in the Army Medical School, Florence, gives a review of this subject in *Le Caducée*, October 18th, 1909). The article begins with a summary of water-borne diseases and the necessity for having a supply of pure water; it then quotes the decrease in sick rate in several Italian cities, especially Naples, which followed the introduction of a good water supply. The writer refers to Article 3 of "Instructions for Military Hygiene in the Royal Italian Army," which deals with the supply of potable water and enumerates the essential points in regard to storing and purifying water. Testi then goes on to discuss the various means of sterilising water:—

(1) *By Heat.*—The "Siemens" apparatus was tried on a large scale in the camp at Saint Maurice and gave satisfaction. He suggests that the "Salvador" apparatus made by the Compagnie Générale Aero-hydraulique de Paris should also be tried. Professors Pagliani and Bertarelli have reported favourably on this apparatus, although the cost of working is somewhat high.

(2) *By Filtration.*—In the Italian Army the Berkefeld filter is preferred and has for some years been supplied to the field hospitals. This filter was adopted as the result of the research work on filters carried out by the late Pharmacien-militaire Coccone (*Giornale Medico del R. Esercito*, 1896), who reported that, although not perfect, the Berkefeld filter in view of its rapid delivery of fairly pure water and low working expense, was the most suitable for troops. The fact that germs grow through the candles can be met by supplying each filter with four candles and only using each candle for a single day, the candles being boiled in the ordinary camp kettles for an hour before being again used. The advanced medical depôts keep a supply of these filters, which can be sent to the different medical units as asked for.

(3) Other means which can be used on an emergency are also given in the regulations, *e.g.*, a clean sponge placed in a funnel, the apparatus to

be cleaned daily with a 3 per cent. solution of hydrochloric acid ; a piece of asbestos cloth may be similarly used (this should be thoroughly washed with pure water daily) ; a barrel thoroughly cleaned inside, if necessary by flaming, and filled with a layer of fine sand ; the engineer regulations contain instructions for a similar field filter using sand, gravel, and charcoal. Capitaine-Major Tirelli has examined one of these filters (*Giornale Medico del R. Esercito*, April, 1902) in order to test its capability for purifying water. (Results are not given.)

(4) *Chemical Sterilisation*.—This may have to be employed on some occasions, *e.g.*, on the march, in most colonial expeditions, or if want of time or material prevent us from employing either of the last two plans. Professor Testi has specially studied a modification of Schumburg's bromine sterilisation method (*Giornale Medico del R. Esercito*, 1901-1902) and has obtained excellent results by varying the quantity of bromine according to the degree of pollution of the water. If badly fouled he allows the bromine to act for ten minutes. This plan was tried by the Italian troops in China in 1901. Lately "tachiol" (fluoride of silver) has been recommended in Italy as a water steriliser ; investigation has, however, shown that this silver salt has a very low bactericidal power. Nitrate of silver is equally efficient and more economical.

To suit, varying conditions a certain amount of latitude must be allowed as to which of the above means are to be employed. Capitaine-Major Ferrari-Lelli, in an excellent pamphlet on Bromatology for Military Surgeons (Florence, 1906), gives a good summary of expert opinion on the collection, supply, storage, transport and purification of drinking water.

Another important point in connection with the water supply of troops is the amount required daily by the soldier. Dr. Ferrari-Lelli's manual, referred to above, gives a table showing the minimum quantities. These tables have, in fact, been used in calculating the supply for the troops. Thus one must calculate 60 to 70 litres as the daily allowance per head in temperate climates, while in hot countries, where facilities for bathing and washing must be increased, the minimum quantity should be 300 litres. During war the scale must be reduced and 9 litres should be estimated for—5 for drinking and cooking, 3 for personal washing, and 1 for wastage by loss. Under exceptional circumstances the daily allowance may even be reduced to 2 to 3 litres. The most liberal water supply in Italy is in the Celio hospital at Rome, where the daily consumption is 690 litres per head in summer and 620 in winter. Finally, Professor Testi quotes the excellent work of Captain Giambarba, of the Royal Engineers, entitled "Collection, Conveyance and Distribution of Drinking Water for Military Buildings" (Rome, 1903), a work which appeals to the military surgeon as well as the army engineer. This work contains many plates and deals exhaustively with the question of water supply from a hygienic as well as a technical point of view. He goes fully into the question of water supply from tanks, which unfortunately still obtains in certain barracks in Southern Italy ; also of ordinary and artesian wells and the importance of the water supply in fortified places. He deals also with Norton tubes, the Italian "Calandra" tubes and "Piana" steel tubes ; the latter are without any welding and can be driven to a depth of 300 metres. Captain Giambarba thinks that drinking water should be supplied in pipes quite distinct from water supplied for washing and sanitary



purposes. Captain Giambarba also gives useful notes on the geological formations of the water-bearing strata of Italy and the methods of collecting water from them.

In conclusion, Professor Testi thinks that the Italian Army is well supplied with pure water. Great attention is paid by the army medical officers to the chemical and bacteriological examination of drinking water, special courses in this subject being held at the Army Medical College, Florence; laboratories have been provided in many of the military hospitals, and quite recently a new one in the Army Medical Inspector-General's office. By these means a constant and intelligent supervision of the water supplied to the troops is assured.

C. E. P.

**The Estimation and Quantitative Significance of Hydrochloric Acid in the Gastric Contents.** By W. H. Wilcox (*The Quarterly Journal of Medicine*).

In the contents of the stomach hydrochloric acid may exist as:—

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|--|-----------------------------|
| (i.) Free hydrochloric acid, <i>i.e.</i> , the acid is not combined with any base, either inorganic or organic.        | } Active hydrochloric acid. |
| (ii.) Hydrochloric acid, which is combined—<br>(a) With proteins;<br>(b) With other nitrogenous organic bases.         |                             |
| (iii.) Hydrochloric acid, which is combined with inorganic bases to form neutral salts, <i>e.g.</i> , sodium chloride. |                             |

The author considers that the only true estimate of the hydrochloric acid secreted by the stomach is the active hydrochloric acid found in the gastric contents. For diagnostic purposes in cases of disease, it is of very much greater importance that the active hydrochloric acid should be known than the amount of free hydrochloric acid. The amount of free hydrochloric acid present in cases of disease of the stomach is a very variable quantity depending on an unknown factor, *viz.*, the amount of proteins present. The amount of active hydrochloric acid present is usually constant within certain limits for a particular disease.

*Detection and Estimation of Free Hydrochloric Acid.*—Before testing gastric contents for free or active hydrochloric acid, they should be filtered through ash-free paper, and the filtrate used for purposes of analysis.

For the detection of free hydrochloric acid Gunzberg's test is reliable and delicate. About 4 grains of phloroglucin and 2 grains of vanillin are dissolved in 1 cc. of absolute alcohol in an evaporating dish, about 2 cc. of gastric contents are added, and the mixture carefully heated in a water-bath; a brilliant scarlet colour is produced by free hydrochloric acid. The reagents should be freshly made up for each test. By this reaction 1 part in 100,000 of hydrochloric acid can be demonstrated; organic acids do not give the test.

The most accurate method of estimating free hydrochloric acid is that devised by Moore, depending on the hydrolysis of methyl acetate by the gastric contents. "Ten cc. of this gastric contents are taken in a small Erlenmeyer flask, 0.5 cc. of the methyl acetate is added, and 5 cc. of the mixture are titrated at once with decinormal alkali, free from carbonate, using phenol-phthalein as indicator. The flask is then placed for a definite time in a thermostat at a temperature of 45° C. (we have used a period of eight hours, but a shorter period will suffice); and at the end of

the period the contents of the flask are titrated again: the increase in the amount of alkali required for neutralisation gives the amount of acetic acid set free by the action of the hydrogen ions of the gastric contents during the interval, and hence an indicator of the concentration of these ions. A simple calculation then gives the concentration of the hydrogen ions. For the purpose of this calculation the total amount of acetic acid capable of being set free from the 0.5 cc. of methyl-acetate added is required, and to obtain this a control is made in which decinormal hydrochloric acid is allowed to act on methyl-acetate in the same concentration, until the titration gives a constant figure for 5 cc. of the mixture. This figure can be obtained once for all for any series carried out about the same time with the same sample of methyl-acetate."

Moore states that the acidity to Gunzberg's reagent may be used as a quantitative test, and can be relied upon for accurate results in rapid clinical work. "Ten cc. of the filtered gastric contents are taken, two drops are removed with a glass rod to a porcelain capsule, a drop of the reagent (phloroglucin and vanillin) added from a dropping bottle, and the mixture evaporated to dryness, preferably on a steam or water-bath. If even a trace of free hydrochloric acid is present, the characteristic red colour appears. In that case a quantity of decinormal alkali is added to the 10 cc. of filtered contents, from one- or two-tenths to one cc., according to the depth of colour obtained on the initial testing. The process of testing is then repeated; if a positive result is obtained more alkali is added, the testing repeated, and so on until a negative result is obtained. Near the end, when the reaction is less marked, the alkali is added in quantities of 0.1 cc. at a time. A little practice enables one to carry out the testing in about five minutes in all, and reduces the number of operations to four or five. As only about 0.1 cc. is removed for each test, and the acid is almost neutralised when the final drops are removed, the loss in this way is very small."

*Methods of Estimating Active Hydrochloric Acid.* — The following process gives good results:—

Two equal volumes of the filtered gastric contents (20 cc.) are taken. (a) One portion is diluted to about 60 cc. with distilled water, 10 cc. of pure nitric acid, about 5 cc. of a solution of iron alum, and a measured excess (30 cc.) of a  $\frac{N}{10}$   $\text{AgNO}_3$  solution are added;  $\frac{N}{10}$  ammonium sulphocyanide solution is run in from a burette until a permanent reddish-brown tint just appears. The difference between the quantity of  $\text{AgNO}_3$  solution added and the ammonium sulphocyanide solution used gives the amount of chlorides present as  $\frac{N}{10}$   $\text{HCl}$ . An evaporating dish may be conveniently used for doing the titration.

(b) The other portion of the gastric contents is placed in a porcelain evaporating dish and evaporated to dryness on a water-bath. The solid residue is heated for an hour on the water-bath. The dish is then placed on a piece of wire gauze and heated with a small Bunsen flame, the flame not coming in actual contact with the dish. The heating is continued for about ten minutes until the residue is well charred. The dish is cooled, about 60 cc. of water and the pure nitric acid are added, the contents being well stirred with a glass rod. The titration is then performed exactly as described above (a) and the quantity of chlorides present given in terms of  $\frac{N}{10}$   $\text{HCl}$ . The difference between the chlorides found in (a) and

(b) expresses with great accuracy the amount of the physiologically active hydrochloric acid.

When estimating the amount of active hydrochloric acid it is necessary to give a test meal and to withdraw it from one to one and a half hours after its administration. The test meal recommended consists of very weak tea (with a little milk and sugar if desired) and a round of thin buttered toast. The gastric contents are obtained by passing a soft tube into the stomach, syphon action being started, if necessary, by withdrawing air from the tube by means of a small glass syringe.

The active hydrochloric acid in a normal case, employing this technique, is about 0.15 per cent., between 0.1 and 0.2 per cent.

**Plague on the West Coast of Africa.**—J. W. Simpson, in a report on plague on the Gold Coast, gives an account of the epidemic which attacked Accra and the outlying stations on the Gold Coast in the spring of 1908. The epidemic started in the usual way by an epizootic among rats at Accra, and this was followed by an outbreak of bubonic plague in the town, with 127 deaths; the disease spread to the other parts of the colony, and the remarkable feature of the epidemics in these parts is that the cases were almost exclusively those of pneumonic plague. The details given illustrate once more the extraordinary infectivity and terrible fatality of this form of the disease. In the village of Nianyano the disease was introduced by a traveller who was sick but only stayed a few hours in the village. His visit was followed in five days by the death of the sick man's host, and that in its turn by the death of no less than sixty-four of the villagers, all from pneumonic plague, practically every case proving fatal.

This record is typical of the outbreaks in the other outlying villages, and of the second and third outbreaks at Accra, all of which were of the pneumonic type. In all about 50 per cent. of cases in the colony were of pneumonic plague, and it would have been interesting to have had some information as to the local conditions which led to the exceptional prevalence of this type, seeing that in India only somewhere about 7 per cent. of all cases of plague are of the pneumonic type.

Dr. Simpson's report is followed by a short history of the outbreak at Accra by Dr. Garland. Then comes the report of Dr. W. M. Graham on the plague laboratory at Accra, which contains a good deal of interesting information on the rats of Accra and their parasites, but says very little about plague; one notes, however, that *Pulex cheopis* is a common rat-flea at Accra.

Dr. A. Connal reports on some experiments in intensifying the Danysz virus, but it is difficult to discover the conclusions that he came to. Apparently some 2,800 doses of the virus were distributed, but the results are not known. The same writer gives an account of the *post-mortem* findings in the fatal cases, and has also some experiments in attempting to infect pigs and chickens with plague; he succeeded in making his pigs ill, but there is no evidence that they were infected with plague.

The measures for dealing with the epidemic consisted in evacuation of the infected houses or villages; in the establishment of a sanitary cordon around Accra, which seems to have worked better than is usual with sanitary cordons; in fumigation or destruction of infected houses, &c., destruction of rats, and in the use of plague vaccine. This last measure was very popular, over 31,000 people submitting to the process, and Dr.

Simpson states that the people actually fought to be the first to be inoculated. He attributes to inoculation the chief part in checking the epidemic.

W. S. H.

**The Presence of *Bacillus Paratyphosus B* in Water.** By Dr. Walter Gaechtgens, Assistant at the Bacteriological Laboratory for Lower Alsace, at Strassburg (*Arbeiten aus dem Kaiserlichen Gesundheitsamte*, vol. xxx., No. 3).—The author commences by saying that the *Bacillus paratyphosus B* is found not infrequently in the dejecta, food and surroundings of man without causing any apparent illness. The bacilli apparently live saprophytically in the human bowel. Rimpau has even found them in the blood of a healthy person. The Typhoid Commission has been able to do a good deal of work on this matter. Conradi first discovered both typhoid and paratyphoid bacilli in the faeces of a typhoid patient, and also in a spring and canal, from which he was probably infected. A number of observers confirmed these discoveries, as also did the author, who further discovered the paratyphoid bacillus in typhoid carriers. An interesting case is mentioned by Beckers, who in one case isolated *B. typhosus* and *B. paratyphosus* from the blood, but only succeeded in obtaining *B. typhosus* from the urine and faeces. Conversely Simon and Denmark have found *B. typhosus* in a paratyphoid case, and similar observations have been made by others. These facts would appear to show epidemiologically a close connection between typhoid and paratyphoid. Uhlenhuth and his colleagues have made important discoveries. They found the paratyphosus as an inhabitant of the bowel of the healthy pig. He and Hübener found the bacillus of swine plague, which cannot be distinguished from paratyphosus serologically or by cultured characteristics, in 51 of 600 healthy pigs. These observers came to the conclusion that *B. paratyphosus* could be found in the bowel of man and animal, healthy as well as ill. They and other observers found the bacillus also in sausage, milk, and smoked goose-flesh. Rimpau discovered the organisms in a yard in which paratyphoid excrement had been emptied and also in the surface drains leading from that yard.

The author then proceeds to a description of how in two cases he isolated *B. paratyphosus* from water; gelatine plates were made with 0.1 and 0.5 cc. of the water, and Heyden-agar plates with 0.2 and 1 cc. of the water; the plates were incubated at the room temperature, about 20° C. After three to four days the colonies on gelatine were counted, after eight to ten days those on agar. The rest of the water, about 200 cc., was mixed with oxychloride of iron according to Müller's method. He recommends as a method of identifying *B. typhosus* in water to add 5 cc. liquor ferri oxychlorati to 3 litres of water. According to Gunning, iron hydroxide is only precipitated if sulphates are present. After the addition of the oxychloride of iron the water was thoroughly stirred with a sterile rod, when a brownish-yellow precipitate shortly formed. After half an hour the supernatant clear fluid was carefully poured off and the sediment passed through a filter. From the paper the remaining flocculi were removed with a sterile spatula and planted out on eudo- and malachite-green agar plates.

Three specimens of water were examined: one from a stream open to contamination, one from water from this stream after it had passed through a filter suspected to be inadequate, and one from a reservoir into

which this probably inadequately filtered water had been allowed to enter.

From all three, after precipitation by Müller's method, bacteria were grown on malachite-green agar, which in cultures and serologically could not be distinguished from *B. paratyphosus* B. Two other examinations of the same water made ten days and two months later were both negative as regards paratyphoid bacilli.

The village which was supplied from the above-mentioned reservoir was suffering at the time from an epidemic of typhoid. To determine whether the paratyphoid bacilli found in the water had anything to do with the epidemic, all the cases of typhoid fever were examined. In none of them were paratyphoid bacilli found.

How did the paratyphoid on this one occasion get into the water? It is impossible to say, but considering how common the paratyphoid bacillus has been shown to be there is nothing astonishing in its being there.

In another case in Strassburg paratyphoid bacilli were isolated from suspected water and again could not be found more than once, nor could they be found in the cases of typhoid who had drunk the suspected water.

It is true that in these instances paratyphoid bacilli appeared to be innocent of causing any illness, but on the other hand there are numerous instances of paratyphoid bacilli having caused illnesses indistinguishable from typhoid. Until we are able to distinguish the pathogenic paratyphoid bacteria from the non-pathogenic ones we must continue to regard all paratyphoid as suspicious and take our measures accordingly.

J. A. B.

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# **Distribution List of SURGEON-GENERALS AND COLONELS**

**REMOVED FROM THE CORPS AND STILL  
ON THE ACTIVE LIST,**

**OFFICERS OF THE ROYAL ARMY MEDICAL  
CORPS**

**AND**

**RE-EMPLOYED RETIRED OFFICERS.**

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**JULY, 1909.**

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*[This List is prepared according to the latest information contained in Official Returns. Officers are requested to register any Diplomas or special qualifications at Headquarters, War Office, in order that this list may be published as complete as possible.]*

## SPECIALIST CERTIFICATES IN :

- a** = State Medicine (R.A.M. College qualification).
- b** = Diploma in Public Health.
- c** = Bacteriology.
- d** = Dental Surgery.
- e** = Dermatology and Venereal Diseases.
- f** = Specific Fevers.
- g** = Laryngology.
- h** = Midwifery and Gynæcology.
- j** = Operative Surgery.
- k** = Ophthalmology.
- l** = Otology.
- m** = Pædiatrics.
- n** = Psychological Medicine.
- o** = Skiagraphy.
- p** = Diploma in Tropical Medicine.

## ARMY MEDICAL SERVICE.

### HEADQUARTER STAFF.

Rank.	Name.	Appointment.
Surgeon-General ..	Keogh, Sir A., K.C.B., M.D., K.H.P.	Director-General of Army Med. Services.
" ..	Gubbins, W. L., C.B., M.V.O., M.B.	Deputy Director-General.
Lieutenant-Colonel .	Irwin, J. M., M.B. .. ..	Assistant Director-General.
" ..	Eckersley, E., M.B. .. ..	Deputy Assistant Director-General.
Major ..	Birrell, E. T. F., M.B. .. ..	" " " "
" ..	Buist, H. J. M., D.S.O., M.B. ..	" " " "
Lieutenant-Colonel .	Macpherson, W. G., C.M.G., M.B.	" " " " (at- tached to the Department of the Director of Military Operations).

### ARMY MEDICAL SERVICE ADVISORY BOARD.

Rank.	Name.	Appointment.
Colonel ..	Bruce, Sir D., Knt., C.B., F.R.S., M.B.	Expert in Tropical Diseases.
Major ..	Horrocks, W. H., M.B. .. ..	Expert in Sanitation.

### ROYAL ARMY MEDICAL COLLEGE.

Rank.	Name.	Appointment.
Colonel ..	Wardrop, D., M.B. .. ..	Commandant and Director of Studies.
Major ..	Spencer, C. G., M.B., F.R.C.S. Eng.	Professor of Military Surgery.
Lieutenant-Colonel .	Simpson, R. J. S., C.M.G., M.B.	" Tropical Medicine.
" ..	Melville, C. H., M.B. .. ..	" Hygiene.
Major (Brevet-Lieutenant-Colonel)	Leishman, Sir W. B., Knt., M.B.	" Pathology.
Major ..	Wanhill, C. F. .. ..	Assistant Professor of Hygiene.
" ..	Harrison, W. S., M.B. .. ..	" Pathology.
Lt.-Colonel (Bt.-Col.)	Lambkin, F. J. .. ..	Lecturer in Syphilology.

### SURGEON-GENERALS.

Name.	Station.	Appointment.
Bourke, G. D., C.B., ..	Dublin .. ..	Principal Med. Officer, Irish Command.
Donovan, W., C.B. ..	York .. ..	" " " Northern Command.
Dorman, J. C., C.M.G., M.B.	London .. ..	" " " Eastern Command.
Ellis, P. M. ..	Naini Tal, India ..	Leave.
Gallwey, Sir T. J., K.C.M.G., C.B., M.D.	Aldershot .. ..	Principal Med. Officer, Aldershot Command.
Gubbins, W. L., C.B., M.V.O., M.B.	War Office, London ..	Headquarter Staff.
Kenny, W. W., M.B., F.R.C.S.l.	Pretoria.. ..	Principal Med. Officer, South Africa.
Sloggett, A. T., C.M.G. ..	Poona, India .. ..	" " " 6th (Poona) Division.
Trevor, F. W., C.B., M.B.	Simla, India .. ..	" " " His Majesty's Forces in India.
Whitehead, H. R., C.B., F.R.C.S.Eng.	Salisbury .. ..	" " " Southern Command.

## COLONELS.

Name.	Station.	Appointment.	Specialist Certifi- cates in
Anderson, L. E. .. ..	Naini Tal, India .. ..	Prin. Med. Officer Allahabad and Fyzabad Brigades, Offg. P.M.O. 8th Division	—
Barrow, H. J. W... ..	Dalhousie, India .. ..	Prin. Med. Offi., 3rd (Lahore) Div.	—
Babbie, W., V.C., C.M.G., M.B.	London .. ..	Inspector of Medical Services ..	—
Bedford, W. G. A., C.M.G., M.B.	Hong Kong .. ..	Prin. Med. Officer, South China	—
Bruce, Sir D., Knt., C.B., F.R.S., M.B.	Uganda .. ..	Sleeping Sickness Commission ..	—
Corker, T. M., M.D. ..	Edinburgh .. ..	Prin. Med. Officer, Scottish Com.	—
Croly, A. E. J., F.R.C.S.I.	Dover .. ..	Administrative Medical Officer ..	—
Dodd, J. R., M.B., F.R.C.S. Eng.	Cork .. ..	" " " ..	b.
Forman, R. H., M.B. ..	Bombay, India .. ..	Principal Medical Officer, Bombay Brigade	—
Ford, R. W., D.S.O. ..	Tidworth .. ..	Administrative Medical Officer ..	—
Goggin, G. T. .. ..	Chester .. ..	Prin. Med. Offi., Western Com...	—
Harwood, J. G., F.R.C.S. Edin.	Calcutta, India .. ..	Leave .. ..	—
Hathaway, H. G... ..	Portsmouth .. ..	Administrative Medical Officer ..	—
Jones, J. M. .. ..	Cairo .. ..	Leave .. ..	—
Jennings, R., M.D. ..	Devonport .. ..	Administrative Medical Officer ..	—
Kerin, M. W. .. ..	Bareilly, India .. ..	Prin. Med. Officer, Bareilly and Gharwal Brigades	—
Lloyd, O. E. P., V.C. ..	Meerut, India .. ..	Prin. Med. Officer, 7th Division	—
MacNeece, J. G. .. ..	Malta .. ..	" " " ..	—
MacNeece, T. F. .. ..	Chatham .. ..	Administrative Medical Officer ..	—
Maclean, F. B. .. ..	Secunderabad, India ..	Prin. Med. Officer, Secunderabad Brigade	—
Murray, H. W., M.B. ..	Gibraltar .. ..	Principal Medical Officer.. ..	—
Moberley, H. J. R. ..	Bangalore, India .. ..	P.M.O., Bangalore and Southern Brigades	—
North, E., F.R.C.S. Edin.	Dublin .. ..	Administrative Medical Officer	—
O'Connor, A. P., C.B., F.R.C.S.I.	Colchester .. ..	" " " ..	—
O'Sullivan, D., F.R.C.S.I.	Quetta, India .. ..	Prin. Med. Officer, 4th Division ..	—
Peterkin, A., M.B. ..	Cape Colony .. ..	Administrative Medical Officer ..	—
Robinson, G. W. .. ..	Pretoria, S. Africa ..	Admin. Med. Officer, Transvaal, O.R.C. and Natal	—
Robinson, S. C. B. ..	Jubbulpore, India .. ..	Prin. Med. Officer, Jubbulpore and Jhansi Brigades	—
Wardrop, D., C.V.O., M.B.	R.A.M. College .. ..	Com. and Director of Studies ..	—

## LIEUTENANT-COLONELS.

*(Under Article 365 of the Royal Warrant.)*

Baker, W. J. .. ..	Cairo, Egypt .. ..	Officer in charge Military Hospital, and Officer Commanding 33rd Coy. R.A.M.C., Acting P.M.O.	—
Butt, E., F.R.C.S.I. ..	Secunderabad, India ..	Officer in charge Military Hospital	—
Battersby, J., M.B., F.R.C.S.I.	Secunderabad, India ..	Leave .. ..	—
Birrell, W. G., M.B. ..	Mauritius .. ..	Senior Medical Officer .. ..	—
Barratt, H. J. .. ..	Fort Canning, St. Setts.	" " " .. ..	b.
Burton, F. H. M., M.D.	Hounslow .. ..	Officer in charge Military Hospital	—
Bond, R. P. .. ..	Chatham .. ..	" " " .. ..	—
Culling, J. C. .. ..	Prospect, Bermuda ..	Senior Med. Officer and Officer in charge Mil. Hosp. and Officer Command. 25th Coy. R.A.M.C.	—

Name.	Station.	Appointment.	Specialist Certifi- cates in
Dick, W., M.B., F.R.C.S. Edin.	Woolwich .. ..	Admin. Med. Officer and Officer in charge Royal Herbert Hosp.	b.
Firth, R. H., F.R.C.S. Eng.	Aldershot .. ..	In charge School of Army Sani- tation and Instructor R.A.M.C. School of Instruction	b.
Faunce, C.E. .. ..	Gibraltar .. ..	Officer in charge Military Hospital	—
Geddes, R.J., D.S.O., M.B.	Jubbulpore, India ..	..	b.
Hodson, R. D. .. ..	London .. ..	Recruiting, "London" District ..	—
Heffernan, W. .. ..	Pembroke Dock ..	Officer in charge Military Hospital	—
Hackett, R. I. D., M.D. ..	Bordon .. ..	Admin. Med. Offi., Bordon Dist.	—
Hamilton, T. W. O. H., C.M.G., M.B.	Aldershot .. ..	Staff Officer to P.M.O. .. ..	—
Irwin, J. M., M.B. ..	War Office, London ..	Headquarter Staff .. ..	—
Johnston, H. H. C.B., M.D.	Curragh .. ..	Officer in charge Military Hospital and Officer Commanding 17th Coy. R.A.M.C.	b.
Jencken, F. J., M.B. ..	Meerut, India .. ..	Officer in charge Military Hospital	b.
Lucas, T. J. R., C.B., M.B.	Bangalore, India ..	Leave .. ..	—
Lambkin, F. J. (Bt.-Col.)	Rochester Row, London	Officer in charge Military Hospital	—
Lynden Bell, E. H. L., M.B.	Allahabad, India ..	Offg. P. M. O., Allahabad and Fyzabad Brigade	—
Macpherson, W.G., C.M.G., M.B.	War Office, London ..	Headquarter Staff .. ..	b.
Morse, R. E. R. .. ..	Cosham .. ..	Officer in charge Military Hospital and Officer Commanding 6th Coy. R.A.M.C.	—
Moore, R.R.H., M.D. ..	Netley .. ..	Officer in charge Medical Division	—
Noding, T. E. .. ..	Cork .. ..	Officer in charge Military Hospital and Officer Commanding 16th Coy. R.A.M.C.	—
Nichols, F. P., M.B. ..	Jullundur, India ..	Officer in charge Military Hospital	—
Nichol, C.E., D.S.O., M.B.	Aldershot .. ..	Com. R.A.M.C. School of Instruc- tion, Offi. Com. Depot R.A.M.C. and Officer in charge records	—
O'Keefe, M. W., M.D. ..	Rawalpindi, India ..	Officer in charge Military Hospital	—
O'Donnell, T. J., D.S.O. ..	Quetta, India .. ..	..	—
Porter, R., M.B. .. ..	Belfast .. ..	Administrative Medical Officer ..	—
Pike, W. W., D.S.O., F.R.C.S.I.	Darjeeling, India ..	Officer in charge Military Hospital	—
Rhodes, J. H. A. .. ..	Tralee .. ..	..	—
Risk, E. J. E. .. ..	Bloemfontein .. ..	Leave .. ..	—
Reade, W. L. .. ..	Dublin .. ..	Officer in charge Royal Infirmary and Officer Commanding 14th Coy. R.A.M.C.	—
Russell, A. F., C.M.G., M.B.	Cottonera, Malta ..	Officer in charge Military Hospital	—
Sawyer, R. H. S., M.B., F.R.C.S.I.	Pretoria, South Africa ..	Leave .. ..	—
Skinner, B. M., M.V.O. ..	Peshawar, India ..	Officer in charge Military Hospital	—
Simson, R. J. S., C.M.G., M.B.	R.A.M. College .. ..	Professor of Tropical Medicine ..	—
Townsend, S., M.D. ..	Dover .. ..	Officer in charge Military Hospital	—
Trøherne, F. H., F.R.C.S. Edin.	Aldershot .. ..	Offi. in charge Cambridge Hospital	b
Trevor, H. O. .. ..	Jamaica .. ..	Senior Medical Officer and Officer Commanding R.A.M.C.	—
Tyrrell, C. R. .. ..	London .. ..	Staff Officer to P.M.O., Eastern Command	—
Thomson, W. B. .. ..	Calcutta, India ..	Officer in charge Military Hospital	—
Tate, A. E. .. ..	Ambala, India ..	..	—
Woodhouse, T. P. (Brevet- Colonel)	Netley .. ..	Officer in charge Royal Victoria Hospital	—
Westcott, S., C.M.G. ..	Mhow, India .. ..	Leave .. ..	b.

## LIEUTENANT-COLONELS.

Name.	Station.	Appointment.	Specialist Certifi- cates in
Adams, G. G. .. ..	Salisbury .. ..	Medical Inspector of Recruits, Southern Command	—
Allen, S. G. .. ..	London .. ..	Recruiting duties .. ..	b.
Adamson, H. M., M.B. ..	Cawnpore, India ..	.. ..	—
Aldridge, A. R., M.B. ..	Simla, India .. ..	Sanitary Officer, Army Head- quarters	b.
Austin, H. W. .. ..	Glasgow .. ..	Officer in charge Military Hospital	—
Brazier-Creagh, G. W., C.M.G.	Lichfield .. ..	" " " "	—
Braddell, M. O'D., M.B.	Lahore, India .. ..	" " " "	—
Beevor, W. C., M.B., C.M.G.	Dalhousie, India ..	" " " "	—
Birt, C. .. ..	Malta .. ..	Special duty .. ..	—
Berryman, W. E. .. ..	Delhi, India .. ..	Officer in charge Military Hospital	—
Blackwell, C. T., M.D. ..	Belgaum, India .. ..	" " " "	b.
Buchanan, J. B. W., M.B.	Londonderry .. ..	" " " "	—
Brown, H. H., M.B. .. ..	Nowshera, India ..	" " " "	—
Burtchaell, C. H., M.B. ..	Dublin .. ..	Staff Officer to Principal Medical Officer, Irish Command	b.
Barefoot, G. H. .. ..	Dinapore, India ..	Officer in charge Military Hospital	—
Bate, A. L. F. .. ..	Rawalpindi, India ..	.. ..	—
Caldwell, R., F.R.C.S. Eng.	.. ..	Sick leave .. ..	b.
Cree, G. .. ..	Madras, India .. ..	Officer in charge Military Hospital and in charge His Excy. The Governor's Body Guard	—
Curtis, J. H. .. ..	Ballincollig .. ..	Officer in charge Military Hospital	—
Carr, H., M.D. .. ..	Netley .. ..	" " " " D Block, Royal Victoria Hospital	—
Cree, H. E. .. ..	Chatham .. ..	Officer in charge Military Hospital	—
Cocks, H., M.B. .. ..	Wellington, India ..	" " " "	—
Clarkson, T. H. F. .. ..	Tower of London ..	" " " "	—
Cottell, R. J. C. .. ..	Royal Hospital, Chelsea..	Deputy Surgeon .. ..	h.
Dodd, A. .. ..	Chester .. ..	Officer in charge Military Hospital	—
Donnet, J. J. C. .. ..	Belfast .. ..	Officer in charge Military Hospital and Officer Commanding 15th Coy. R.A.M.C.	—
Duncan, S. E. .. ..	Birmingham .. ..	Offl. in ch. Troops and Recruiting	—
Daly, J. H. .. ..	Tipperary .. ..	Officer in charge Military Hospital	—
Daly, T. .. ..	Ferozepore, India ..	Officer in charge Military Hospital and Special Health Officer, Feroze- pore Cantonment	—
Davidson, J. S., M.B. ..	Royal Herbert Hospital, Woolwich	Registrar .. ..	—
Donegan, J. F. .. ..	Alexandria, Egypt ..	Officer in charge Military Hospital	—
Donaldson, J. .. ..	Aldershot .. ..	.. ..	—
Elkington, H. P. G. .. ..	Jhansi, India .. ..	Officer in charge Military Hospital	b.
Eckersley, E., M.B. .. ..	War Office, London ..	Headquarter Staff .. ..	b.
Freyer, S. F., C.M.G. ..	Maymyo, India .. ..	Leave .. ..	—
Forrest, J. R. .. ..	Maymyo, India .. ..	Officer in charge Military Hospital	b.
Fletcher, H. J., M.B. ..	Sialkot, India .. ..	" " " "	—
Ferguson, N. C., C.M.G., M.B.	Millbank, London ..	Assistant to "Officer" in charge Military Hospital	b.
Fallon, J. .. ..	Preston .. ..	Officer in charge Military Hospital	—
Fayrer, Sir J., Bt., M.D., F.R.C.S. Edin.	Duke of York's School	Officer in Medical Charge.. ..	—
Gubbin, G. F. .. ..	Colaba, India .. ..	Officer in charge Military Hospital	—
Green, J. S., M.B. .. ..	Nasirabad, India ..	" " " "	—
Gordon, P. C. H. .. ..	Rangoon, India .. ..	" " " "	b.
Gordon-Hall, F. W. G., M.B.	Muttra, India .. ..	" " " "	—
Gerrard, J. J., M.B. .. ..	Forrest, Malta .. ..	" " " "	—
Heuston, F. S., C.M.G., F.R.C.S.I.	Edinburgh .. ..	Officer in charge Military Hospital and O.C. 13th Coy. R.A.M.C.	—

Name.	Station.	Appointment.	Specialist Certifi- cates in
Hunter, G. D., D.S.O. ..	Aldershot ..	Medical Inspector of Recruits ..	—
Henderson, R. S. F., M.B.	Simla, India ..	Sec. to P.M.O., H.M.'s Forces in India ..	—
Haines, H. A., M.D. ..	Fyzabad, India ..	Leave .. .. .	—
Hale, G. E., D.S.O. ..	Rawalpindi, India ..	" .. .. .	—
Hickson, S., M.B. ..	Wynberg, S. Africa ..	" .. .. .	—
Hearn, M. L. ..	Dublin ..	Medical Inspector of Recruits ..	—
Hall, R. H., M.D. ..	Colchester ..	" .. .. .	—
Hanley, R. G., M.B. ..	Dublin ..	Officer in charge Military Hospital, Portobello ..	—
Hennessy, D., M.D. ..	Ahmednagar, India ..	Officer in charge Military Hospital	—
Holyoake, R. ..	Ambala, India ..	Leave .. .. .	—
Johnson, C. W., M.B. ..	Sheerness ..	Officer in charge Military Hospital	—
Jones, F. W. C., M.B. ..	Colchester ..	" .. .. .	—
Josling, C. L. ..	London ..	Recruiting, "London District" ..	—
Kirkpatrick, R., C.M.G., M.D.	Devonport ..	Officer in charge Military Hospital and O.C. 7th Coy. R.A.M.C.	—
Kennedy, A. ..	Aden ..	Officer in charge Military Hospital	—
Knaggs, H. T., M.D. ..	Abbassia, Egypt ..	Officer in charge Troops ..	b.
Lilly, A. T. I. ..	Canterbury ..	Officer in charge Military Hospital	—
Lane, C. A., M.B. ..	Tidworth ..	Officer in charge Military Hospital and O.C. 20th Coy. R.A.M.C.	—
Lavie, T. G. ..	Newbridge ..	Officer in charge Military Hospital	—
Le Quesne, F. S., V.C. ..	Lucknow, India ..	Officer in charge Section Hospital	—
McCreery, B. T., M.B., F.R.C.S.I.	Agra, India ..	Leave .. .. .	b.
Magrath, C. W.S., M.D.	Hilsea ..	Officer in charge Military Hospital	—
Morris, W. A. ..	Cawnpore, India..	" " " "	b. p.
McGill, H. S. ..	Poona, India ..	" " " "	—
Maher, J. ..	Potchefstroom, S. Africa	" " " "	—
Manders, N. ..	Nuwara-Eliya, Ceylon ..	Sen. Med. Off. and O.C. 26th Coy. R.A.M.C., and Officer in charge Military Hospital	—
Meek, J., M.D. ..	Poona, India ..	Leave .. .. .	b.
Morris, A. E., M.D. ..	Kamptee, India ..	Officer in charge Military Hospital	—
Macleod, R. L. R., M.B.	Karachi, India ..	" " " "	b.
Melville, C. H., M.B. ..	R.A.M. College ..	Professor of Hygiene ..	b.
MacDonald, C. J., M.D. .	Fermoy ..	Officer in charge Military Hospital and Anaesthetist	—
Mathias, H. B., D.S.O. ..	Egypt ..	Principal Med. Officer Egyptian Army ..	—
Marks, G. F. H., M.D. ..	Newcastle-on-Tyne ..	Officer in charge Military Hospital	—
Nash, L. T. M. ..	Ranikhet, India ..	" " " "	—
Newland, F. R., M.B. ..	York ..	Staff Officer to P.M.O., Northern Command ..	—
O'Connell, D. V., M.D. ..	Shorncliffe ..	Officer in charge Military Hospital	b.
O'Halloran, M., M.D. ..	Woolwich ..	Officer in charge Auxiliary Hosp. and Garrison Sanitary Officer	—
O'Donnell, J. J., M.B. ..	Kirkee, India ..	Officer in charge Military Hospital	—
O'Callaghan, D. M. ..	Kuldana, India ..	" " " "	—
Powell, S., M.D. ..	Secunderabad ..	" " " "	—
Philson, S. C. ..	London ..	Recruiting duties ..	—
Penton, R. H., D.S.O. ..	York ..	Medical Inspector of Recruits, Northern Command ..	b.
Reid, J. M., M.D. ..	Victoria, S. China ..	Off. in charge Mil. Hosp., and Off. Com. 27th Coy. R.A.M.C.	—
Russell, M. W. ..	London ..	Medical Inspector of Recruits, Eastern Command ..	—
Reilly, C. C. ..	Sandhurst ..	Surgeon R.M. College ..	—
Rowan, H. D., M.B. ..	Murree, India ..	Officer in charge Military Hospital	—
Russell, J. J., M.B. ..	Limerick ..	" " " "	—
Swabey, L. W. ..	Sitapur, India ..	" " " "	—
Stuart, J. R., M.B. ..	Pachmarhi, India ..	" " " "	—



Name.	Station.	Appointment.	Specialist Certi- ficates in
Sloggett, H. M. ..	Aldershot ..	Officer in charge Connaught Hosp.	—
Swan, W. T., M.B. ..	Chakrata, India ..	" " Military Hospital	—
Shine, J. M. F., M.D. ..	Naini Tal, India ..	" " " "	—
Sparkes, C. S. ..	Deepcut and Blackdown ..	" " Detention Hosp.	—
Sexton, M. J., M.D. ..	Dublin ..	Officer in charge Military Hospital, Arbor Hill	—
Starr, W. H. ..	Shwebo, India ..	Officer in charge Military Hospital	—
Sutton, A. A., D.S.O. ..	Woolwich ..	Officer in charge Medical Division	—
Salvage, J. V., M.D. ..	London ..	Sanitary Officer, Area south of Thames	b.
Saunders, D. M., M.D. ..	Dublin ..	Sanitary Officer ..	b.
Thompson, H. N., D.S.O., M.B.	Lucknow, India ..	Officer in charge Military Hospital	—
Turner, W. ..	York ..	Offi. in charge Mil. Hosp. and Offi. Com. 8th Coy. R.A.M.C.	—
White, H. L. E. ..	Crete ..	Officer in charge Military Hospital	—
Weston, G. E. ..	Parkhurst ..	" " " "	—
Wilson, G., M.B. ..	Multan, India ..	" " " "	—
Winter, T. B. ..	Bareilly, India ..	Leave ..	b.
Wills, S. R. ..	Hollywood ..	Officer in charge Military Hospital	—
Wilson, J. B., M.D. ..	Woolwich ..	Officer in charge Surgical Div., Roy. Herbert Hosp.	—
Will, J., M.B. ..	Kinsale ..	" " " "	—
Wright, R. W. ..	Woolwich ..	Sen. Med. Offi., Royal Arsenal ..	—
Windle, R. J., M.B. ..	Royal Hospital, Kilmain- ham, Dublin	Physician and Surgeon ..	—
Whaite, T. Du B., M.B. ..	Gibraltar ..	" " " "	—
Yourdi, J. R., M.B. ..	Fort Regent, Jersey ..	Offi. in charge Mil. Hosp. & S.M.O.	—
Yarr, M. T., F.R.C.S.I. ..	Valletta, Malta ..	" " Military Hospital ..	k.

## MAJORS.

Austin, J. H. E. ..	Hounslow ..	" " " "	—
Anderson, E. C., D.S.O. ..	Rawalpindi, India ..	" " " "	—
Alexander, J. D., M.B. ..	Cahir ..	Officer in charge Military Hospital	—
Austin, R. F. E. ..	Chatham ..	Company Officer ..	—
Anderson, J. B. ..	Benares, India ..	Officer in charge Military Hospital	c.
Archer, S. A. ..	Jullundur, India ..	Staff Surgeon ..	k.
Addams-Williams, L. ..	Tidworth ..	Company Officer ..	—
Burnside, E. A. ..	Mount Abu, India ..	Officer in charge Military Hospital, Lawrence School and Residency Surgeon	—
Browne, E. G. ..	Dublin ..	" " " "	b.
Bullen, J. W., M.D. ..	Madras, India ..	Offi. in charge Brigade Laboratory and Specialist in Prevention of Disease	b.
Blenkinsop, A. P. ..	R.A.M. College, London ..	Asst. to Commandant ..	—
Beach, T. B. ..	Woolwich ..	Royal Arsenal ..	—
Bewley, A. W. ..	Agra, India ..	Temp. Offi. in charge Mil. Hosp.	—
Beveridge, W. W. O., D.S.O., M.B.	London ..	Medical Officer, Royal Army Clothing Department	b.
Bray, G. A. T. ..	Southampton ..	Embarking Medical Officer ..	—
Buist, H. J. M., D.S.O., M.B.	War Office, London ..	Headquarter Staff ..	—
Brogden, J. E. ..	Pirbright ..	Officer in charge Military Hospital	—
Begbie, F. W. ..	Colchester ..	" " " "	—
Beyts, W. G. ..	St. John's Wood ..	Officer in charge Military Hospital	—
Buchanan, G. J., M.B. ..	Bareilly, " ..	" " " "	—
Bray, H. A. ..	Woolwich ..	With R.A.M.C. Special Reserve ..	—
Buswell, F. R. ..	London ..	Recruiting Duties ..	—
Berryman, H. A. ..	Gibraltar ..	" " " "	o.

Name.	Station.	Appointment.	Specialist Certifi- cates in
Barnett, K. B., M.B., F.R.C.S.I.	Dover .. ..	.. .. .	m.
Boyle, M., M.B. ..	Lucknow, India ..	Specialist in Electrical Science, 8th Division, and in charge X-ray Apparatus	o.
Buist, John M., M.B. ..	Wynberg, S. Africa ..	Sanitary Officer, Cape Colony ..	b.c.p.
Blackham, R. J. ..	Peshawar, India ..	San. Off., 1st Peshawar Division	b. h.
Birrell, E. T. F., M.D. ..	War Office, London ..	Headquarter Staff ..	k.
Bliss, E. W. ..	Mhow, India ..	Specialist in Operative Surgery ..	j.
Brodrigg, E. ..	Hythe ..	Officer in charge Military Hospital and Ophthalmic Specialist	k.
Clark, S. F., M.B. ..	Middelburg, C.C., S. Africa	Officer in charge Military Hospital	b.
Copeland, R. J., M.B. ..	Meerut, India ..	Offg. Staff Off., Medical Mobilisa- tion Store, 7th Division	—
Connor, J. C., M.B. ..	Bangalore, India ..	.. .. .	—
Crawford, G. S. ..	Malta ..	Sanitary Officer ..	b. p.
Condon, E. H., M.B. ..	Cardiff ..	Officer in charge Military Hospital	—
Chambers, A. J. ..	Netley ..	Officer in charge Staff and Families	—
Collins, D. J., M.B. ..	Wynberg, S. Africa ..	Company Officer and Skiagraphist	k. b.
Clark, E. S., M.B. ..	Nowshera, India ..	.. .. .	f.
Cameron, K. M., M.B. ..	Simla, India ..	Staff Surgeon in charge Army Headquarters Staff and Estab- lishments	j.
Carter, J. E., M.B. ..	Pretoria, S. Africa ..	Company Officer ..	f. b.
Campbell, J. H., D.S.O.	Curepipe, Mauritius ..	Officer in charge Mil. Families' Hospital	h.
Cochrane, E. W. W., M.B.	Aldershot ..	Asst. Sanitary Officer A.C. ..	b. c.
Clements, R. W., M.B. ..	Wellington, India ..	Sanitary Officer, 9th Division ..	o. b. p.
Corkery, M.P. ..	Jhansi, India ..	In charge Brigade Laboratory and Spec. in Prevention of Disease	a.
Clarke, T. H. M., C.M.G., D.S.O., M.B.	Plymouth ..	.. .. .	—
Cummins, S. L., M.B. ..	Netley ..	Clinical Pathologist ..	c. p.
Dalton, C. ..	Aden ..	Offi. in charge Brigade Laboratory	—
Duggan, C. W., M.B. ..	India ..	Leave ..	—
Dunn, H. N., M.B. ..	Multan, India ..	.. .. .	—
Dansey-Browning, G. ..	Mill Hill ..	Officer in charge Military Hospital	b. p.
Elliott, C. R., M.D. ..	Cork ..	Sanitary Officer ..	b.
Erskine, W. D., M.B. ..	Khartoum, Egypt ..	Leave ..	—
Evans, P., M.B. ..	Cairo, Egypt ..	Specialist in Operative Surgery,	b. f. j.
Forde, B., M.B. ..	Bloemfontein, S. Africa ..	Offi. in charge Mil. Hosp., and O.C. 24th Company, R.A.M.C.	b.
Ferguson, J. D., D.S.O. ..	Aldershot ..	.. .. .	—
Faichnie, N., M.B. ..	Mhow, India ..	Divisional Sanitary Officer ..	b. p.
Fleming, C. C., D.S.O., M.B.	Aldershot ..	Instructor R.A.M.C. School of Instruction	—
Faichnie, F. G. ..	London ..	Officer in charge Chelsea Barracks	—
Fowler, C. E. P., F.R.C.S. Eng.	Gibraltar ..	Sanitary Officer ..	k. b.
French, H. C. ..	Woolwich ..	Dermatologist ..	e. b.
Fleury, C. M. ..	Tidworth ..	.. .. .	o.
Fox, A. C. ..	Tientsin, N. China ..	Senior Medical Officer and O.C. R.A.M.C.	h.
Fairrie, S. H., M.B. ..	Shorncliffe ..	Officer in charge Military Families' Hospital	h.
Forrest, J. V., M.B. ..	Woolwich ..	Adjutant 12th and 34th Co'ys. R.A.M.C.	—
Gray, W. L., M.B. ..	Winchester ..	Officer in charge Military Hospital	b.
Girvin, J. ..	Hyderabad, India ..	.. .. .	—
Graham, W. A. S. J. ..	Nowgong, India ..	.. .. .	—
Gibbard, T. W., M.B. ..	Dagshai, India ..	.. .. .	k.
Goodwin, T. H. J. C., D.S.O.	Quetta, India ..	.. .. .	j. o.

Name.	Station.	Appointment.	Specialist Certifi- cates in
Green, S. F. St. D., M.B.	Aldershot .. ..	Officer in charge Louise Margaret Hospital	b.
Grattan, H. W. .. ..	R.A.M. College, London..	Pathological Laboratory .. ..	b. c.
Grech, J. .. ..	Meerut, India .. ..	Specialist in Electrical Science and in charge X-ray Section, Special Plague Officer	o.
Gunter, F. E., M.B. ..	Lucknow, India .. ..	Specialist in Operative Surgery ..	j.
Hall, R. J. D. .. ..	Jamaica .. ..	Officer in charge Military Hospital	—
Horrocks, W. H., M.B. ..	London .. ..	Expert in Sanitation Army Medical Service Advisory Board	b.
Hale, C. H., D.S.O. ..	Strensall .. ..	Officer in charge Military Hospital	—
Holt, M. P. C., D.S.O. ..	Kasauli, India .. ..	In charge Cantonment Hospital..	j.
Hassard, E. M. .. ..	Shorncliffe .. ..	Officer in charge Military Hospital	—
Hallaran, W., M.B. ..	London .. ..	Recruiting Duties .. ..	—
Healey, C. W. R. .. ..	Kamptee, India .. ..	" " " "	—
Hardy, F. W., M.B. ..	Golden Hill .. ..	Officer in charge Military Hospital	b.
Healy, C. J., M.B. ..	Queenstown .. ..	" " " "	—
Hardy, W. E. .. ..	Wynberg, S. Africa ..	" " " "	—
Hennessy, J., M.B. ..	Poonamallee, India ..	Officer in charge Section Hospital	—
Hinge, H. A. .. ..	Ootacamund, India ..	Staff Officer Divisional Medical Mobilisation Stores, 9th Division	—
Harrison, W. S., M.B. ..	R.A.M. College .. ..	Assistant Professor of Pathology..	c.
Howell, H. A. L. .. ..	Gibraltar .. ..	" " " "	f.
Hayes, E. C. .. ..	Netley .. ..	" " " "	b. k.
Hooper, A. W., D.S.O. ..	Shorncliffe .. ..	" " " "	—
Hewatson, H. .. ..	Fort Canning, Str. Setts..	Leave .. ..	a. b.
Hudleston, W. E. .. ..	Mhow, India .. ..	" " " "	b. f.
Inniss, B. J. .. ..	Shahjehanpur, India ..	Officer in charge Military Hospital	—
Julian, O. R. A., C.M.G. (Brevet-Lieut.-Colonel)	Kasauli, India .. ..	" " " "	b.
Jackson, R. W. H., M.B.	Port Royal, Jamaica ..	Officer in charge Military Hospital and Sanitary Officer	b.
Jennings, J. W., D.S.O.	Mandalay, India .. ..	Officer in charge Military Hospital	o.
Jameson, J. C., M.B. ..	Cairo, Egypt .. ..	Company Officer .. ..	b.
Johnson, H. P., M.R.C.P. Lond.	Bloemfontein, South Africa	" " " "	—
Jones, T. P., M.B. ..	Windsor .. ..	" " " "	—
Kelly, J. F. M., M.B. ..	Cork .. ..	" " " "	—
Keble, A. E. C. .. ..	Gibraltar .. ..	Officer in charge Garrison Disp. Staff and Departments, Specialist in Midwifery	h. b.
Kiddle, F., M.B. .. ..	Wellington, India ..	Specialist in Ophthalmology and in charge Cantonment Hospital	k.
Killery, St. J. B. .. ..	Chaubuttia, India.. ..	Officer in charge Military Hospital	—
Leishman, Sir W. B., Knt. M.B. (Brevet-Lieut.-Col.)	R.A.M. College, London..	Professor of Pathology .. ..	—
Luther, A. J. .. ..	Thayetmyo, India .. ..	Officer in charge Military Hospital	—
Lenchan, T. J., M.B. ..	Seaforth .. ..	" " " "	—
Lawson, C.B., M.B. ..	Netley .. ..	Officer in charge Surgical Division	o. j.
Lewis, R. C. .. ..	Pembroke Dock .. ..	Officer in charge Military Hospital	—
Longhurst, B. W. ..	Warley .. ..	" " " "	d.
Lawson, D. .. ..	Netley .. ..	Officer in charge Venereal Division	—
Morgan, F. J. .. ..	Barrackpore, India ..	Officer in charge Military Hospital	—
McCulloch, T., M.B. ..	Lebong, India .. ..	" " " "	—
Macdonald, S., M.B. ..	Kowloon, China .. ..	" " " "	—
Morgan, J. C. .. ..	Kilworth Camp .. ..	Officer in charge N.D. Hospital ..	b.
Moores, S. G. .. ..	Aldershot .. ..	" " " "	b.
Mould, W. T. .. ..	Dover .. ..	" " " "	—
McLoughlin, G. S., D.S.O., M.B.	Chester .. ..	Medical Inspector of Recruits, Western Command	—
Mawhinny, R. J. W. ..	Athlone .. ..	Officer in charge Military Hospital	—

Name.	Station.	Appointment	Specialist Certifi- cates in
MacCarthy, I. A. O.	Tanglin, Straits Setts.	Officer in charge Military Hospital and Officer Commanding 32nd Coy. R.A.M.C.	—
Morphew, E. M.	Roorkee, India	Officer in charge Military Hospital	—
Mitchell, L. A., M.B.	Woking	Adjutant " " " "	—
Martin, C. B., M.B.	Netley	Adjutant " " " "	—
McNaught, J. G., M.D.	Wynberg, S. Africa	" " " "	b.
McDermott, T., M.B.	Allahabad, India	Specialist in Ophthalmology and Staff Surgeon	k.
More, L. P., M.B.	Murree, India	Staff Officer Medical Mobilisation Stores, 2nd Division	—
Moore, G. A., M.D.	Woolwich	Med. Off. R.M. Academy, Specialist in Laryngology	g.
Marder, N.	Netley	Off. in ch. Convalescent Division	—
Mansfield, G. S., M.B.	Norwich	Officer in charge Military Hospital	—
Mangin, F. M.	Aldershot	Specialist in Ophthalmology	k.
McMunn, J. R.	Pretoria, S. Africa	Staff Off. to P.M.O., South Africa	f.
Master, A. E., M.B.	Imtarfa, Malta	Officer in charge Military Hospital	g.
Morgan, C. K., M.B.	Cairo, Egypt	" " " "	o.
Milner, A. E.	London	Recruiting Duties	o.
Maurice, G. T. K.	Muttra, India	Leave " " " "	m.
Morris, A. H.	Edinburgh	Sanitary Officer	b. c.
MacDougall, A. J., M.B.	Colombo, Ceylon	" " " "	c.
Marriott, E. W. P. V.	Gibraltar	" " " "	o.
McKessack, P., M.B.	Vacoas, Mauritius	Officer in charge N.D. Hospital, Sanitary Officer	b. c.
McCarthy, J. McD., M.B.	Chester	Sanitary Off., Western Command	a. b. p.
Norrington, H. L. W.	Chatham	Officer in charge Mil. Families' Hospital	h.
O'Reilly, H. W. H., M.B.	Colchester	" " " "	—
Poole, W. C., M.B.	Buttevant	Officer in charge Military Hospital	b.
Pocock, H. I.	Kailana, India	Officer in charge Section Hospital	d.
Parry, H. J., D.S.O., M.B.	Maritzburg, South Africa	Officer in charge Military Hospital	—
Powell, E. E.	Aldershot	Officer in charge Isolation Hospital	—
Pearse, A.	" " " "	Leave " " " "	b. p.
Porter, F. J. W., D.S.O.	Tower Hill, W. Africa	Senior Medical Officer	—
Pilcher, E. M., D.S.O., M.B., F.R.C.S.Eng.	Blakang Mati, Straits Setts.	Officer in charge Military Hospital	j.
Pollock, C. E.	Valletta, Malta	Specialist in Venereal Diseases and Dermatology, Anaesthetist	e. o.
Prynn, H. V.	Gibraltar	" " " "	k.
Proffit, C. W., M.B.	Bulford	Officer in charge Military Hospital	g.
Perry, S. J. C. P.	Brighton	" " " "	o.
Probyn, P. J., D.S.O., M.B.	Victoria, S. China	Sanitary Officer, Company Officer	b.
Poe, J. M. B.	Aldershot	" " " "	—
Ritchie, J., M.B.	Woolwich	Recruiting Duties	—
Rawnsley, G. T.	Longmoor	Officer in charge Military Hospital	—
Reilly, C. W.	Dum Dum, India	Officer in charge Military Hospital, Civil Surgeon	b.
Robinson, O. L.	Netley	Secretary and Registrar	b.
Read, H. W. K.	Landour, India	Officer in charge Military Hospital	—
Rivers, J. H.	Woolwich	" " " "	o.
Riddick, G. B.	Calcutta, India	Officer in charge Garrison Disp., Ft. William, Deptmtl. Followers' Hosp. Hastings, Staff Surgeon	—
Rattray, M. MacG., M.B.	Bangalore, India	Leave " " " "	—
Scott, B. H.	Edinburgh	Medical Inspector of Recruits	b.
Stone, C. A., M.D.	Bellary, India	Officer in charge Military Hospital	—
Smith, F., D.S.O.	Murree, India	Sanitary Officer, 2nd Division	b.
Smithson, A. E., M.B.	Harrismith, S. Africa	Officer in charge Military Hospital	b. p.
Shanahan, D. D.	Secunderabad, India	" " " "	—
Stalkartt, C. E. G., M.D.	Gosport	Officer in charge Military Hospital	—

Name.	Station.	Appointment.	Specialist Certificates in
Stanistreet, G. B., M.B. ..	Salisbury .. ..	Staff Officer to Principal Medical Officer, Southern Command	—
Slyter, E. W., M.B. ..	Secunderabad, India ..	.. .. .	—
Symons, F. A., M.B. ..	Colombo, Ceylon .. ..	Temp. Officer in charge Mil. Hosp.	—
Samman, C. T. .. ..	Shorncliffe .. ..	.. .. .	n. b.
Spencer, C. G., M.B., F.R.C.S.Eng.	R.A.M. College, London..	Professor of Military Surgery	j.
Silver, J. P., M.B. ..	Edinburgh .. ..	.. .. .	—
Sweetnam, S. W... ..	Poona, India .. ..	.. .. .	—
Steel, E. B., M.B. ..	Neemuch, India .. ..	Officer in charge Military Hospital, Specialist in Mental Science	n.
Staddon, H. E. .. ..	Curragh .. ..	Sanitary Officer .. ..	—
Smith, L. F., M.B. ..	Royal Arsenal, Woolwich	.. .. .	f. b.
Statham, J. C. B. ..	Pretoria, S. Africa ..	Bacteriologist and Sanitary Officer	b. c. p.
Swabey, M. .. ..	India .. ..	.. .. .	m.
Stammers, G. E. F. ..	Tidworth .. ..	Sanitary Officer, Eastern Area, Southern Command	a. b.
Stallard, H. G. F. ..	Aldershot .. ..	Officer Commanding "C" Com- pany, Dépôt, R.A.M.C.	—
Thurston, H. C., C.M.G. ..	St. George's, Bermuda ..	Officer in charge Military Hospital	—
Thacker, R. C. .. ..	Karachi, India .. ..	Embarkation Staff Officer and Staff Surgeon	—
Thomson, J., M.B. ..	Woolwich .. ..	Offi. in charge Mil. Families' Hosp.	—
Tate, G. W., M.B. ..	Dundalk .. ..	" " Military Hospital ..	b. p.
Tyacke, N. .. ..	Devonport .. ..	.. .. .	—
Thurston, H. S. .. ..	Millbank, London ..	Company Officer .. ..	—
Thompson, A. G., M.B. ..	Ferozepore, India ..	Staff Surgeon and in charge Ordnance Dépôt	b.
Taylor, W. J., M.B. ..	Ballykinler Camp.. ..	Officer in charge N.D. Hospital ..	b. o.
Tyrrell, A. F. .. ..	Gibraltar .. ..	Leave .. ..	—
Tibbits, W., M.B. ..	Shoeburyness .. ..	Officer in charge Military Hospital	—
Thom, G. St. C., M.B. ..	Sabathu, India .. ..	Officer in charge Military and Cantonment Hospital	l. g.
Watson, J. J. C., C.I.E., M.D., F.R.C.S. Edin.	Portsmouth .. ..	Officer in charge Families and Departments	—
Weir, J. C., M.B. .. ..	Naini Tal, India .. ..	Sanitary Officer, 8th Division ..	b.
Winter, H. E. .. ..	Colaba, India .. ..	Embarkation Med. Offi., Bombay	—
Way, L. .. ..	Cosham .. ..	Company Officer .. ..	—
Williams, E. McK. ..	York .. ..	.. .. .	—
Whitestone, C. W. H., M.B.	Peshawar, India .. ..	Staff Officer for Medical Mobilisa- tion Store	—
Wade-Brown, F. J. ..	Kirkee, India .. ..	Officer in charge Military Hospital	—
Withers, S. H., M.B. ..	Gharial, India .. ..	.. .. .	—
Williams, E. M. .. ..	Fermoy .. ..	Officer in charge Mil. Families' Hospital	h.
Waring, A. H. .. ..	Secunderabad, India ..	Specialist in Electrical Science ..	o.
Ward, W. A. .. ..	Rochester Row, London..	.. .. .	e.
Wanhill, C. F. .. ..	R.A.M. College .. ..	Assistant Professor Hygiene ..	b. c.
Young, C. A. .. ..	Curepipe, Mauritius ..	Officer in charge Military Hospital and Officer Commanding 31st Coy. R.A.M.C.	—

## CAPTAINS.

Archer, G. J. S., M.B. ..	Belfast .. ..	Specialist in Operative Surgery, and Company Officer	j.
Ashe, F. .. ..	Colchester .. ..	Offi. in charge Mil. Families' Hosp.	h.
Anderson, H. S. .. ..	Valetta, Malta .. ..	.. .. .	—
Adye-Curran, W. J. P.	Cosham .. ..	Specialist in Operative Surgery ..	j.
Argles, R. L. .. ..	Multan, India .. ..	Leave .. ..	—
Adderley, A. C. .. ..	Leeds .. ..	.. .. .	—

Name.	Station.	Appointment.	Specialist Certifi- cates in
Aylen, E. V. ..	Kirkee, India ..	.. .. .	e.
Adye-Curran, S. M. ..	Kilkenny ..	Officer in charge Military Hospital	b.
Ainsworth, R. B. ..	Dover ..	.. .. .	b.
Ahern, D. ..	Queenstown ..	.. .. .	—
Anderson, R. G. ..	Attached Egyptian Army	.. .. .	—
Ahern, M. D. ..	Ferozepore, India ..	Leave	—
Arthur, A. S., M.B. ..	Nasirabad, India ..	Officer in charge Cantonment Hosp.	—
Anderson, J. A., M.B. ..	Bloemfontein, S. Africa ..	Sanitary Officer ..	—
Anthonisz, E. G. ..	Madras, India ..	Staff Surgeon, Fort St. George ..	—
Bowen, A. W. N. ..	Elizabeth Castle, Jersey ..	Officer in charge Military Hospital	—
Browne-Mason, H. O. B.	London ..	Officer in charge Wellington Bar- racks	e.
Berne, J. G. ..	Colaba, India ..	.. .. .	g.
Bourke, E. A. ..	Bloemfontein, S. Africa ..	Officer in charge Families' Hosp.	b. f.
Barrow, H. P. W. ..	Liverpool ..	Adjutant West Lancashire Divi- sion, R.A.M.C.T.	c. p.
Brakenridge, F. J. ..	Attached Egyptian Army	.. .. .	b.
Blackwell, W. R. ..	Lucknow, India ..	.. .. .	—
Butler, S. G. ..	Pretoria, S. Africa ..	Specialist in Operative Surgery ..	j.
Bond, J. H. R. ..	York ..	Officer in charge Staff and Depart- ments	—
Babington, M. H. ..	Valletta, Malta ..	Clinical Pathologist ..	c.
Baker, W. L. ..	Dublin ..	Specialist in Ophthalmology ..	k.
Bennett, W., M.B. ..	Cork ..	.. .. .	a.
Biggam, T. M. B. ..	R.A.M. College ..	.. .. .	—
Bartlett, B. S. ..	Colchester ..	.. .. .	—
Bennett, E. ..	Wolverhampton ..	Adjutant, North Midland Division R.A.M.C.T.	—
Brown, R. T., M.D. ..	London ..	Sanitary Officer, Northern Area, Eastern Command	b. c.
Bennett, W. L., M.B., F.R.C.S. Edin. ..	Edinburgh ..	Leave ..	—
Burke, B. B. ..	Crownhill ..	Specialist in Laryngology ..	l.
Baillie, G., M.B. ..	Tidworth ..	.. .. .	—
Black, R. B., M.B. ..	Attached Egyptian Army	.. .. .	—
Brunskill, J. H., M.B. ..	Dalhousie, India ..	Sanitary Officer, 3rd Division ..	—
Bateman, H. R. ..	Uganda ..	Sleeping Sickness Commission ..	c.
Bransbury, H. A. ..	Warley ..	.. .. .	e.
Barbour, J. H., M.B. ..	Jubbulpore, India ..	Offi. in charge Gun Carriage Fact.	—
Bostock, J. S., M.B. ..	Aldershot ..	.. .. .	—
Beatty, M. C., M.B. ..	Enniskillen ..	Officer in charge Military Hospital	b.
Balck, C. A. J. A., M.B. ..	York ..	.. .. .	—
Bagshawe, H. V. ..	Lebong, India ..	.. .. .	—
Browne, W. W. ..	Dublin ..	.. .. .	b.
Bell, J. G., M.B. ..	Newport ..	Officer in charge Military Hospital	—
Bridges, R. H. ..	Aldershot ..	.. .. .	—
Brown, G. H. J., M.B. ..	Ranikhet, India ..	.. .. .	—
Bramhall, C. ..	York ..	.. .. .	—
Bousfield, L., M.D. ..	Attached Egyptian Army	.. .. .	—
Bowle, S. C. ..	Deolali, India ..	.. .. .	—
Byam, W. ..	Cairo, Egypt ..	.. .. .	—
Beadnell, H. O. M. ..	Lahore Cantonment, India	Staff Surgeon ..	—
Buchanan, R. J. B. ..	Winchester ..	.. .. .	b.
Booth, E. B., M.D. ..	Kamptee, India ..	.. .. .	—
Brown, C. G. ..	Lucknow, India ..	Specialist in Operative Surgery ..	—
Benson, W., M.B. ..	Rawalpindi, India ..	.. .. .	—
Bryden, R. A. ..	Bloemfontein, S. Africa ..	Anæsthetist ..	—
Blackwell, T. S. ..	Secunderabad, India ..	.. .. .	—
Carroll, F. F., M.B. ..	Woolwich ..	.. .. .	j.
Carter, G. B., M.B. ..	St. Thomas' Mount, India	Officer in charge Military Hospital	—
Collingwood, P. H. ..	Victoria, S. China ..	.. .. .	—
Crisp, G. B. ..	Mhow, India ..	Staff Offi. for Mobilisation Stores	—
Cowan, J., M.B. ..	Woolwich ..	Bacteriologist ..	c.

Name.	Station.	Appointment.	Specialist Certifi- cates in
Curme, D. E. .. ..	R.A.M. College .. ..	.. ..	.. ..
Cunningham, R. A., M.B.	Netley .. ..	With R.A.M.C. Special Reserve	b.
Crawford, V. J. .. ..	Portsmouth .. ..	Officer in charge Military Families' Hospital	h.
Chopping, A. .. ..	Peshawar, India .. ..	Leave .. ..	—
Connolly, E. P. .. ..	Cardiff .. ..	Adjutant, Welsh Div. R.A.M.C.T.	—
Cumming, C. C., M.B.	R.A.M. College .. ..	.. ..	—
Carylon, A. F. .. ..	Port Lokkoh, W. Africa..	Officer in charge Military Hospital	—
Croly, W. C. .. ..	Cork .. ..	Company Officer .. ..	—
Cotton, F. W. .. ..	Wongkufu, West Africa..	Officer in charge Military Hospital	—
Carroll, G. .. ..	Templemore .. ..	.. ..	—
Churton, J. G. .. ..	Aldershot .. ..	"Specialist in Operative Surgery, Cambridge Hospital	j.
Cuthbert, J. M., M.B.	Tower Hill, W. Africa ..	Sanitary Officer .. ..	c.
Carr, C. H., M.D. .. ..	R.A.M. College .. ..	.. ..	—
Crosthwait, W. S. .. ..	R.A.M. College .. ..	.. ..	—
Cautley, J. B. .. ..	Cawnpore, India .. ..	Officer in Medical charge Harness and Saddle Factory and Departmental Followers' Hospital	d.
Cowey, R. V. .. ..	Tidworth .. ..	Off. in charge Military Families' Hospital	h.
Clarke, J. B., M.B.	Edinburgh .. ..	Surgical Specialist .. ..	j.
Cotterill, L. .. ..	Edinburgh .. ..	Recruiting Duties .. ..	—
Craig, B. A. .. ..	Victoria, S. China .. ..	.. ..	—
Crossley, H. J. .. ..	Bury .. ..	Officer in charge Military Hospital	—
Clarke, F. A. H. .. ..	Sheffield .. ..	" " " "	—
Conway, J. M. H., F.R.C.S.I.	Richmond .. ..	" " " "	—
Coates, T. S., M.B.	Brackenbir Moor .. ..	Officer in charge Troops .. ..	—
Carmichael, J. C. G., M.B.	Fleetwood .. ..	.. ..	—
Carmichael, D. G., M.B.	Trawsfynydd .. ..	Officer in charge Military Hospital	—
Crawford, J. M. M.	Woolwich .. ..	.. ..	—
Collins, R. T. .. ..	Chakrata, India .. ..	.. ..	—
Cathcart, G. E. .. ..	Khanspur, India .. ..	Officer in charge Military Hospital	—
Cahill, R. J., M.B.	Peshawar, India .. ..	.. ..	—
Connell, H. B. .. ..	R.A.M. College .. ..	.. ..	—
Campbell, J., M.B.	Allahabad, India .. ..	Leave .. ..	b.
Cordner, R. H. L.	Rawalpindi, India .. ..	Leave .. ..	—
Carter, H. St. M., M.D.	Cottonera, Malta .. ..	Company Officer .. ..	—
Churchill, G. B. F.	Lucknow, India .. ..	.. ..	—
Cromie, M. J. .. ..	Delhi, India .. ..	.. ..	—
Delap, G. G., D.S.O.	Aldershot .. ..	Assist. Inst., R.A.M.C. School of Instruction, and O.C. "B" Coy. Depot, R.A.M.C.	—
Douglas, H. E. M., V.C., D.S.O.	.. ..	Leave .. ..	b.
Dennis, B. R., M.B.	Cosham .. ..	.. ..	c.
Dorgan, J., M.B. .. ..	Queenstown .. ..	.. ..	a. b. p.
Douglass, P. C. .. ..	Weedon .. ..	Officer in charge Military Hospital	—
Duffey, A. C., M.D.	Kilbride Camp .. ..	" " N.D. " "	h.
Davidson, H. A., M.B.	R.A.M. College .. ..	.. ..	b.
Davis, W. .. ..	R.A.M. College .. ..	.. ..	—
Davidson, P., D.S.O., M.B.	Netley .. ..	.. ..	—
Dawson, F. W. W., M.B.	Woolwich .. ..	.. ..	—
Dunbar, B. H. V., M.D.	York .. ..	.. ..	—
Duguid, J. H., M.B.	Barry and Buddon Camps	Officer in charge .. ..	—
Dudding, T. S. .. ..	Chapel Bay .. ..	Officer in charge Troops .. ..	—
Dunkerton, N. E. .. ..	Pretoria, S. Africa .. ..	Anæsthetist .. ..	—
Douglas, J. H., M.D.	Secunderabad, India .. ..	Spec. in Prevention of Disease and in charge Brigade Laboratory	b.
Dwyer, P., M.B. .. ..	Jubbulpore, India .. ..	Officer in charge Brigade Lab. ..	—
Davy, P. C. T., M.B.	Nowgong, India .. ..	Leave .. ..	—
Doig, K. A. C. .. ..	India .. ..	" .. ..	—

Name.	Station.	Appointment.	Specialist Certifi- cates in
Ellery, E. E. . . . .	Devonport . . . . .	Specialist in Operative Surgery . .	j.
Elsner, O. W. A. . . . .	Kinsale . . . . .	Officer in charge Military Hospital	—
Ensor, H., D.S.O., M.B.	R.A.M. College . . . . .	.. .. .	—
Evans, C. R. . . . .	Halifax . . . . .	Officer in charge Military Hospital	—
Ellery, R. F. . . . .	Okehampton . . . . .	Officer in charge Camp . . . . .	—
Ellis, W. F. . . . .	Dalhousie, India . . . . .	Officer in charge Cant. Hospital	—
Easton, P. G. . . . .	Aldershot . . . . .	.. .. .	—
Emerson, H. H. A., M.B.	Prospect, Bermuda . . . . .	.. .. .	—
Fuhr, R. S. H., D.S.O. . .	Millbank, London . . . . .	.. .. .	h.
Fell, M. H. G. . . . .	Cairo, Egypt . . . . .	Sanitary Officer . . . . .	b. p
Falkner, P. H., F.R.C.S.I.	Watford, Bermuda . . . . .	Officer in charge Military Hospital	—
Foster, J. G., M.B. . . . .	Curragh . . . . .	With Special Reserves . . . . .	—
Ford, E. G., M.B. . . . .	Strensall . . . . .	.. .. .	—
Fawcus, H. B., M.B. . . . .	R.A.M. College . . . . .	Hygiene Laboratory . . . . .	a. b.
Fielding, T. E., M.B. . . .	Mount Auriol, West Africa	Officer in charge Military Hospital	c.
Furnivall, C. H. . . . .	York . . . . .	Training Special Reserve . . . . .	—
Fitzgerald, Fitz G. G. . .	Dover . . . . .	Company Officer . . . . .	—
Fry, W. B. . . . .	Millbank, London . . . . .	.. .. .	c.
Fleming, C. E., M.B. . . .	Woolwich . . . . .	Ophthalmologist . . . . .	k.
Fawcett, R. F. M. . . . .	Gosport . . . . .	.. .. .	—
Falkner, M. W. . . . .	Curragh . . . . .	Specialist in Operative Surgery . .	j.
Foulds, M. F. . . . .	R.A.M. College . . . . .	.. .. .	—
French, E. G., M.D., F.R.C.S.E.	Edinburgh.. . . .	.. .. .	—
Foster, R. L. V., M.B. . .	Egypt . . . . .	.. .. .	—
Franklin, R. J. . . . .	Glasgow . . . . .	Recruiting Duties . . . . .	—
Fawcett, H. H. J. . . . .	Hilsea . . . . .	.. .. .	—
Fairbairn, J., M.B. . . . .	Colaba, India . . . . .	.. .. .	—
Fraser, A. N., M.B. . . . .	Glasgow . . . . .	Adjutant, Lowland Div.R.A.M.C.T.	—
Frost, A. T., M.B. . . . .	Curragh . . . . .	.. .. .	—
Ferguson, G. E. . . . .	Alexandria, Egypt . . . . .	.. .. .	—
Fawcett, C. E. W. S., M.B.	Bangalore, India . . . . .	.. .. .	—
Farrant, P. . . . .	Jamaica . . . . .	.. .. .	—
Gwynn, W. P. . . . .	Quetta, India . . . . .	.. .. .	—
Gallie, J. S. . . . .	Ahmednagar, India . . . . .	Officer in charge Cant. Hospital	—
Gill, J. G. . . . .	Peshawar, India . . . . .	Officer in charge Section Hospital, Specialist in Ophthalmology	—
Goddard, G. H. . . . .	Alderney . . . . .	Officer in charge Military Hospital	h.
Goldsmith, G. M., M.B.. .	Maymyo, India . . . . .	.. .. .	—
Greenwood, A. R. . . . .	Aldershot . . . . .	Specialist in Operative Surgery . .	j.
Goodwin, W. R. P. . . . .	R.A.M. College . . . . .	.. .. .	—
Gibson, A. W. . . . .	Tidworth . . . . .	Specialist in Operative Surgery . .	j.
Gatt, J. E. H., M.D. . . . .	Limerick . . . . .	.. .. .	—
Gray, A. C. H., M.B. . . . .	Uganda, E. Africa . . . . .	Seconded with Foreign Office . .	—
Glanvill, E. M., M.B. . . .	Harrismith, S. Africa . . . . .	.. .. .	—
Grant, M. F. . . . .	Karachi, India . . . . .	.. .. .	—
Garland, F. J., M.B. . . . .	Aden . . . . .	Officer in charge Section Hospital Crater	—
Gater, A. W. . . . .	Cliffton, India . . . . .	Officer in charge Military Families' Hospital	—
Gibbon, T. H., M.D. . . . .	Cottonera, Malta . . . . .	.. .. .	—
Graham, J. H., M.B. . . . .	Gibraltar . . . . .	.. .. .	—
Hopkins, C. H. . . . .	Poona, India . . . . .	.. .. .	f.
Hall, S. O.. . . .	Secunderabad, India . . . . .	Spec. in Midwifery and Diseases of Women and Children	h.
Heffernan, F. J. C., F.R.C.S.I.	Lucknow, India . . . . .	Staff Surgeon . . . . .	—
Herrick, H. . . . .	Karachi, India . . . . .	.. .. .	—
Hewitt, E. P. . . . .	Norwich . . . . .	.. .. .	—
Hodgson, J. E. . . . .	Rochester Row, London.. . . .	.. .. .	a.
Houghton, J. W. H., M.B.	.. .. .	West African Leave . . . . .	b.
Harvey, D., M.B.. . . .	Naini Tal, India . . . . .	Specialist in Prevention of Dis.	a.
Humphrey, L. . . . .	Poona, India . . . . .	.. .. .	j.



Name.	Station.	Appointment.	Specialist Certifi- cates in
Harrison, L. W., M.B.	R.A.M. College	.. ..	—
Harvey, F. . .	Devonport	Sanitary Officer, Western Area, Southern Command	b. c. p.
Hime, H. C. R., M.B.	Aldershot	Adjutant Depôt R.A.M.C.	b. k.
Hartigan, J. A., M.B.	Shorncliffe	.. ..	—
Hyde, D. O., M.B.	R.A.M. College	.. ..	—
Hamerton, A. E., D.S.O.	Uganda	Sleeping Sickness Commission	c.
Houghton, G. J.	R.A.M. College	.. ..	—
Henderson, P. H., M.B.	Portsmouth	.. ..	a.
Hunt, R. N., M.B.	Bordon	Off. in charge Receiving Station	—
Howley, H. E. J. A.	Lichfield	Training Special Reserve	—
Hull, A. J. . .	Jutogh, India	Officer in charge Military and Cantonment Hospital	—
Harding, D. L., F.R.C.S.I.	Conway	Officer in charge Troops	—
Hyde, P. G., M.B.	Queenstown	.. ..	—
Harvey, W. J. S.	Bere Island	Officer in charge N.D. Hospital	—
Hayes, A. H.	Leeds	.. .. Military Hospital	—
Harding, N. E. J., M.B.	Aberdeen	.. ..	p.
Holden, C. W.	Peking, North China	.. ..	b. p.
Harty, T. E.	Mandalay, India	Temp. Off. in charge Milit. Hosp.	—
Hughes, G. W. G.	Attached Egyptian Army	.. ..	—
Hanafin, P. J.	Wynberg, S. Africa	Anæsthetist	b.
Hildreth, H. C., F.R.C.S.	Maymyo, India	Staff Surgeoncy, Burma Division	—
Edin.			
Hole, R. B., M.B.	Quetta, India	.. ..	—
Harding, H., M.B.	Quetta, India	.. ..	—
Hayes, G. S. C.	R.A.M. College	.. ..	—
Hallows, R. C., M.B.	Cairo, Egypt	Anæsthetist	—
Harvey, G. A. D.	Cairo, Egypt	Officer in charge Military Families' Hospital	—
Heron, G. W.	Egyptian Army	.. ..	—
Hoare, J. E.	Secunderabad, India	.. ..	—
Humfrey, R. E., M.B.	Nasirabad, India	.. ..	—
Hastings, A. E. F.	Allahabad, India	Off. in charge Section Hosp., Fort	—
Inkson, E. T., V.C.	Bangalore, India	.. ..	—
Irvine, F. S., M.B.	.. ..	Seconded for service under the Colonial Office	—
Irwin, A. W. A.	Kildare	Officer in charge Non-dieted Hosp.	—
Ievers, O., M.B.	Pretoria	Officer in charge Non-dieted Hosp., Artillery Barracks	—
Irvine, A. E. S.	Potchefstroom, S. Africa	.. ..	—
Jameson, A. D.	Aldershot	Specialist in Dermatology and Venereal Disease	c.
Johnson, J. T., M.D.	Newcastle-on-Tyne	.. ..	b.
Jones, J. L.	Woolwich	.. ..	—
Johnstone, D. P.	Maymyo, India	Offg. Divisional Sanitary Officer	b.
Knox, E. B., M.D.	R.A.M. College	.. ..	b.
Kennedy, J. C., M.B.	Millbank, London	.. ..	c.
Kiddle, H. H.	Bordon	.. ..	—
Kelly, W. D. C., M.B.	Aldershot	Anæsthetist, Cambridge Hospital	—
Kelly, H. B., M.B.	Dublin	.. ..	—
Kempthorne, G. A.	Lahore Cantonmt., India	Leave	—
Keane, M.	Muttra, India	.. ..	—
Lowsley, M. M.	Aldershot	.. ..	h.
Lauder, T. C., M.B.	Tower Hill, W. Africa	Officer in charge Military Hospital	b. p.
Leake, J. W.	Devonport	.. ..	a. b.
Lloyd, R. H.	Exeter	Adjutant, Wessex Div. R.A.M.C.T.	—
Langstaff, J. W.	.. ..	West African Leave	b.
Lloyd, L. N., D.S.O.	London	Adjutant, 1st and 2nd London Division R.A.M.C.T.	—
Lauder, F. P.	.. ..	West African Leave	—
Lelean, P. S., F.R.C.S.	Meerut, India	Temp. Sanitary Officer, 7th Div.	b. j.
Eng.			

Name.	Station.	Appointment.	Specialist Certifi- cates in
L'Estrange, E. F. Q. ..	Bellary, India ..	.. .. .	..
Lambelle, F. W., M.B. ..	York ..	Specialist in Operative Surgery ..	j.
Long, H. W., M.B. ..	R.A.M. College ..	.. .. .	..
Lambert, F. C. ..	Cape Town, S. Africa ..	Embarking Medical Officer ..	..
Lewis, S. E., M.B. ..	Simonstown, S. Africa ..	Officer in charge Troops ..	..
Lewis, R. R. ..	Secunderabad, India ..	Specialist in Dermatology ..	..
Lucas, T. C., M.B. ..	Bombay, India ..	Surg. to H.E. the Governor of Bombay.	b.
Luxmoore, E. J. H. ..	Meerut, India ..	.. .. .	..
Low, N. ..	Cannanore, India ..	Officer in charge Military Hospital	..
Lloyd-Jones, P. A., M.B. ..	Valletta, Malta ..	Leave ..	..
Lynch, J. P. ..	Meiktila, India ..	Officer in charge Military Hospital	..
Lithgow, E. G. R. ..	Rawalpindi, India ..	.. .. .	..
Lewis, R. P. ..	Harrismith, S. Africa ..	.. .. .	..
Martin, H. G. ..	Agra, India ..	Spec. in Midwifery, and Electrical Science, Special Plague Officer	h.
Macpherson, J. D. G., M.B. ..	Meerut, India ..	Spec. in Oper. Surg., Staff Surg. in charge R. A. Followers' Hosp.	..
Mainprise, C. W. ...	Aldershot ..	.. .. .	..
MacKenzie, T. C., D.S.O. ..	Attached Egyptian Army ..	.. .. .	..
Morton, H. M., M.B. ..	Aldershot ..	.. .. .	..
Matthews, J. ..	Karachi, India ..	.. .. .	k.
McLoughlin, W. M. ..	London ..	Sick Leave ..	..
MacLaughlin, A. M., M.B. ..	Mabanta, West Africa ..	Officer in charge Military Hospital	a.
Martin, J. F., M.B. ..	R.A.M. College ..	.. .. .	..
McDonnell, E., M.B. ..	Aldershot ..	Company Officer, No. 2 Company	..
McLennan, F., M.B. ..	Fort George ..	Officer in charge Military Hospital	..
Murphy, J. P. J., M.B. ..	R.A.M. College ..	.. .. .	b.
Myles, C. D., M.B. ..	Curragh ..	.. .. .	..
Mitchell, A. H. McN. ..	Devonport ..	Specialist in Ophthalmology ..	k.
McMunn, A. ..	Mullingar ..	Officer in charge Military Hospital	..
McKenzie, J. M. B. ..	Aldershot ..	.. .. .	..
Meadows, S. M. W. ..	Rawalpindi, India ..	Officer in charge Mil. Families' Hospital and Staff Surg. "A"	..
Meldon, J. B. ..	Dublin ..	.. .. .	..
MacNicol, R. H., M.B. ..	Maymyo, India ..	.. .. .	..
McEntire, J. T., M.B. ..	Potchefstroom, S. Africa ..	Sanitary Officer and Anæsthetist	..
MacDowell, W. MacD. ..	Ambala, India ..	.. .. .	..
Moore, E. H. M. ...	Potchefstroom, S. Africa ..	.. .. .	..
Meaden, A. A. ..	Neemuch, India ..	Officer in charge Followers' Hosp.	..
Millar, C. R. ..	Fethard ..	" " N.D. Hospital ..	..
Maughan, J. St. A. ..	Cottonera, Malta ..	.. .. .	..
Meredith, R. G., M.B. ..	Crete ..	.. .. .	..
McNeight, A. A., M.B. ..	Cawnpore, India ..	.. .. .	..
Maydon, W. G., M.B. ..	Dinapore, India ..	.. .. .	..
Moss, E. L. ..	Chaubuttia, India ..	.. .. .	..
Moriarty, T. B. ..	Luchnow, India ..	.. .. .	..
McConaghy, W., M.B. ..	Pretoria, S. Africa ..	.. .. .	..
Marett, P. J. ..	Forrest, Malta ..	.. .. .	..
Nickerson, W. H. S., V.C., M.B. ..	York ..	Sanitary Officer, Northern Com...	b. c.
Nicholls, H. M., M.B. ..	Deolali, India ..	Officer in charge Military Hospital	..
Norman, H. H. ..	Bhamo, India ..	" " " "	..
Nokes, F. H., M.B. ..	Purandhur, India ..	" " " "	..
Nealor, W. S. ..	Thayetmyo, India ..	.. .. .	..
Nimmo, W. C. ..	Fyzabad, India ..	.. .. .	..
O'Grady, S. de C., M.B. ...	Cairo, Egypt ..	Leave ..	a.
O'Gorman, C. J., D.S.O. ..	Scarborough ..	.. .. .	..
O'Flaherty, A. R. ..	Devonport ..	Anæsthetist and Company Officer	..
Ormsby, G. J. A., M.D. ...	Fyzabad, India ..	Temp. Offi. in charge Milit. Hosp.	..
O'Reilly, P. S. ..	Sitapur, India ..	.. .. .	k.
O'Donoghue, D. J. F. ..	West Africa ..	.. .. .	..
Ommanney, F. M. M. ..	Aden ..	Staff Surgeon Steamer Point	..

Name.	Station.	Appointment.	Specialist Certi- ficates in
Osburn, A. C. ..	Rangoon, India ..	.. .. .	—
Otway, A. L., M.B. ..	Mhow, India ..	.. .. .	—
O'Brien, C. W. ..	Peshawar, India ..	Leave .. .. .	—
Ormrod, G., M.B. ..	Landour, India ..	Staff Surgeon .. .. .	—
Penny, F. S., M.B. ..	Chatham ..	Officer in charge Casualty Hosp. ..	a. b.
Parker, L. E. L. ..	Poona, India ..	Sanitary Officer, 6th Division ..	c. b.
Packer, H. D. ..	Devonport ..	Specialist in Bacteriology ..	c.
Palmer, H. K. ..	Khandalla, India ..	Officer in charge Military Hospital ..	—
Palmer, F. J. ..	Cork ..	Specialist in Operative Surgery ..	j.
Prescott, J. J. W., D.S.O.	Newcastle ..	Adjutant, Northumbrian Division ..	k.
		R.A.M.C.T.	
Parry, F. M., M.B. ..	Maidstone ..	Adjutant, Home Counties Division ..	—
		R.A.M.C.T.	
Powell, J., M.B. ..	Wilberforce, West Africa ..	Officer in charge Military Hospital ..	—
Purser, L. M., M.B. ..	Colchester ..	Company Officer .. .. .	g. l.
Popham, R. L. ..	Curragh ..	" .. .. .	—
Power, W. M. ..	R.A.M. College ..	" .. .. .	—
Pinches, H. G. ..	R.A.M. College ..	" .. .. .	—
Parsons, A. R. C. ..	Tower Hill, W. Africa ..	" .. .. .	j.
Powell, E. W. ..	Belgaum, India ..	Officer in charge Brigade Lab. ..	c.
		and Cantonment Hospital	
Parkes, E. E., M.B. ..	Colchester ..	Anæsthetist .. .. .	k.
Potter, T. J. ..	Millbank, London ..	Bacteriologist .. .. .	b. c.
Pennefather, E. M. ..	Limerick ..	" .. .. .	—
Patch, B. G. ..	Multan, India ..	" .. .. .	—
Powell, J. E. ..	Ranikhet, India ..	Staff Surgeon and in charge Can- tonment General Hospital ..	—
Pallant, S. L. ..	Mhow, India ..	Consulting Surgeon, R.M. Railway ..	—
Painton, G. R. ..	Aldershot ..	" .. .. .	—
Power, P., M.B. ..	Belfast ..	Anæsthetist .. .. .	—
Pascoe, J. S. ..	Cyprus ..	Officer in charge Military Hospital ..	—
Potts, E. T., M.D. ..	Pretoria, S. Africa ..	" .. .. .	—
Priestley, H. E. ..	Gibraltar ..	" .. .. .	—
Rattray, M. MacG., M.B. ..	Bangalore, India ..	Sick leave .. .. .	—
Ross, N. H., M.B. ..	Aldershot ..	O.C. "A" Coy. Depot ..	R.A.M.C. —
Rutherford, N. J. C., M.B. ..	Canterbury ..	" .. .. .	—
Richards, F. G. ..	Jamaica ..	" .. .. .	—
Roch, H. S. ..	Leeds ..	Adjutant, West Riding Division ..	c.
		R.A.M.C.T.	
Robinson, J. H. ..	Curragh ..	Officer in charge Military Families' ..	h.
		Hospital	
Ronayne, C. R. L., M.B. ..	Warrington ..	Officer in charge Military Hospital ..	k.
Riach, W., M.D. ..	Mount Auriol, W. Africa ..	" .. .. .	b. k.
Ryan, E. ..	R.A.M. College ..	" .. .. .	—
Rowan-Robinson, F. E., M.B. ..	Woolwich ..	" .. .. .	—
Ritchie, T. F., M.B. ..	Fermoy ..	" .. .. .	—
Rogers, H., M.B. ..	R.A.M. College ..	" .. .. .	—
Reed, G. A. K. H. ..	Maidstone ..	Officer in charge Military Hospital ..	—
Rutherford, R., M.B. ..	Edinburgh ..	Company Officer .. .. .	—
Ranking, R. M., M.B. ..	Woolwich ..	" .. .. .	—
Richmond, J. D., M.B. ..	Quetta, India ..	Staff Surgeon .. .. .	—
Rugg, G. F. ..	Colchester ..	" .. .. .	—
Ryley, C. ..	Shoeburyness ..	" .. .. .	b.
Russell, H. W., M.D. ..	Ashton ..	Officer in charge Military Hospital ..	—
Richard, G. H. ..	Calcutta, India ..	Leave .. .. .	—
Roberts, F. E. ..	Valetta, Malta ..	" .. .. .	—
Rahilly, J. M. B., M.B. ..	Cairo, Egypt ..	" .. .. .	—
Rose, A. M., M.D. ..	Prospect, Bermuda ..	Sanitary Officer .. .. .	b.
Rees, G. H., M.B. ..	Khartoum, Egypt ..	Officer in charge Military Hospital ..	—
Ritchie, M. B. H., M.B. ..	Rawalpindi, India ..	" .. .. .	—
Selby, R., M.B. ..	Meerut, India ..	Leave .. .. .	e.
Scott, A. L. ..	Aldershot ..	" .. .. .	c.

Name.	Station.	Appointment.	Specialist Certifi- cates in
Sloan, J. M., M.B., D.S.O.	Aberdeen .. ..	Adjt., Highland Div. R.A.M.C.T.	a.
Simson, H.	Millbank, London .. ..	.. .. .	a.
Seeds, A. A., M.D.	Hounslow .. ..	.. .. .	—
Siberry, E. W.	Aldershot .. ..	Coy. Officer Nos. 1 and 3 Coy.	—
Smith, C. S., M.B.	Glen Imaal Camp .. ..	Officer in charge N.D. Hospital..	—
Safford, A. H.	Allahabad, India .. ..	.. .. Brig. Laboratory	b. c.
Sewell, E. P., M.B.	Belfast .. ..	Sanitary Officer, Belfast District	a. b.
Straton, C. H.	London .. ..	.. .. London ..	a.
Spiller, W. M. H., M.B.	R.A.M. College .. ..	.. .. .	b.
Shea, H. F., M.B.	Millbank, London .. ..	.. .. .	—
Stephens, F. A.	Birmingham .. ..	Adjutant, South Midland Division R.A.M.C.T.	—
Steele, W. L.	Chester .. ..	.. .. .	—
Sparkes, W. M. B.	Uganda .. ..	.. .. .	1.
Smith, S. B., M.D.	R.A.M. College .. ..	.. .. .	—
Skinner, R. McK.	Glasgow .. ..	.. .. .	b.
Sheehan, G. F.	Dublin .. ..	.. .. .	n.
Sampey, A. W.	.. ..	.. .. .	b. p.
Smallman, A. B., M.B.	Quetta, India .. ..	Sanitary Officer, 4th Division ..	b.
Storrs, R.	Bulford .. ..	Offi. in charge Mil. Families' Hosp.	—
Seccombe, J. W. S.	Dalhousie, India .. ..	Specialist in Prevention of Disease	b.
Skelton, D. S.	Uganda .. ..	Employed under Colonial Office..	b.
Stanley, C. V. B., M.D.	Egyptian Sanitary Dept.	.. .. .	—
Stack, H. T., M.B.	Tipperary .. ..	.. .. .	—
Sylvester-Bradley, C. R.	Meerut, India .. ..	.. .. .	—
Sidgwick, H. C., M.B.	Jamaica .. ..	.. .. .	—
Sinclair, M., M.B.	Sialkot, India .. ..	.. .. .	—
Sherren, G. H.	Belgaum, India .. ..	Special duty with 2nd Leicester- shire Regiment	—
Scatchard, T.	Agra, India .. ..	.. .. .	—
Symons, V. H.	Bloemfontein, S. Africa..	.. .. .	—
Sampson, F. C., M.B.	.. ..	.. .. .	—
Smyth, R. S., M.D.	Ambala, India .. ..	Officer in charge X-ray Apparatus	—
Stewart, H., M.B.	Upper Topa, India .. ..	.. .. Military Hospital	—
Thorp, A. E.	Portland .. ..	.. .. .	—
Taylor, H. S.	Fort Canning, S. Setts. ..	.. .. .	—
Tobin, J.	Devonport .. ..	.. .. Mil. "Fam. Hosp.	b.
Thorpe, L. L. G.	R.A.M. College .. ..	.. .. .	—
Thomson, C. G.	Amritsar, India .. ..	Officer in charge Military and Cantonment Hospitals	—
Tyndale, W. F., C.M.G., M.B.	Tidworth .. ..	.. .. .	b.
Turner, F. J.	Jubbulpore, India .. ..	Staff Surgeon .. ..	—
Thomson, D. S. B., M.B.	Attached Egyptian Army ..	.. .. .	—
Turner, C. H.	Murree, India .. ..	Staff Surgeon and Specialist in Operative Surgery	—
Turnbull, J. A.	Nowshera, India .. ..	.. .. .	—
Thurston, L. V.	Saugor, India .. ..	.. .. .	—
Thomson, C. P., M.D.	Egyptian Army .. ..	.. .. .	—
Thompson, R. J. C.	Pretoria, S. Africa .. ..	.. .. .	—
Tabuteau, G. G.	Jhansi, India .. ..	.. .. .	—
Unwin, T. B., M.B.	Lichfield .. ..	.. .. .	—
Vaughan, W. F. H.	Bangalore, India .. ..	.. .. .	—
Watts, B.	Campbellpore, India .. ..	Officer in charge Military Hospital	b. b.
Weld, A. E.	Valletta, Malta .. ..	In charge Military Families' Hosp.	h.
Walton, H. B. G.	Pontefract .. ..	Officer in charge Military Hospital	b. c.
Winkfield, W. B.	Gosport .. ..	.. .. .	—
Wroughton, A. O. B.	R.A.M. College .. ..	.. .. .	—
Woodside, W. A.	Ipswich .. ..	Adjutant, East Anglian Division R.A.M.C.T.	—
Webb, A. L. A.	R.A.M. College .. ..	.. .. .	a. b. p.
Winslow, L. F. F.	Bradford .. ..	Officer in charge Military Hospital	—
Wood, L.	Fleetwood .. ..	.. .. .	—

Name.	Station.	Appointment.	Specialist Certifi- cates in
Wingate, B. F. .. ..	Solon, India .. ..	Officer in charge Military Hospital	—
Walker, F. S., F.R.C.S.I.	R.A.M. College .. ..	.. ..	—
Waring, A. D., M.B. ..	Chatham .. ..	With Special Reserves .. ..	—
Weston, A. F. .. ..	.. ..	West African Leave .. ..	c.
Waters, W. J. .. ..	Devonport .. ..	With Special Reserves .. ..	—
Whelan, J. F., M.B. ..	Liverpool .. ..	.. ..	—
West, J. W., M.B. .. ..	Dublin .. ..	Specialist in Operative Surgery ..	j.
Worthington, E. S. ..	Colchester .. ..	With Special Reserves .. ..	—
Wells, A. J. W. .. ..	Aldershot .. ..	.. ..	—
Woodley, R. N. .. ..	Belfast .. ..	With Special Reserves .. ..	—
Winder, J. H. R., M.D. ..	Dublin .. ..	With R.A.M.C. Special Reserve ..	—
Wilson, R. C., M.B. ..	Netley .. ..	.. ..	j.
Williamson, A. J., M.B. ..	Woolwich .. ..	Specialist in Operative Surgery ..	j.
Walker, N. D., M.B. ..	.. ..	.. ..	b.
Webb, H. G. S. .. ..	Ambala, India .. ..	.. ..	b.
Winder, M. G. .. ..	R.A.M. College .. ..	.. ..	—
Wood, A. E. B., M.B. ..	Shorncliffe .. ..	.. ..	—
Webster, J. A. W. .. ..	Gravesend .. ..	.. ..	—
Wilmot, R. C. .. ..	Dublin .. ..	Company Officer .. ..	—
Watson, D. P., M.B. ..	Aden .. ..	.. ..	—
Wetherrell, M. C., M.D. ..	Roorkee, India .. ..	Officer in charge Infectious Hosp.	—
Wright, T. J. .. ..	Maymyo, India .. ..	Leave .. ..	b.
Whitehead, E. C., M.B. ..	Pretoria, S. Africa .. ..	Officer in charge Mil. Fam. Hosp.	—
Wiley, W., M.B. .. ..	Bangalore, India .. ..	.. ..	—
Wilson, H. T. .. ..	Barian, India .. ..	Officer in charge Military Hospital	—
Winkworth, H. C. .. ..	Cottonera, Malta .. ..	.. ..	d.
Wallace, G. S., M.B. ..	Aldershot .. ..	.. ..	b.
Weston, W. J. .. ..	Gibraltar .. ..	Anæsthetist .. ..	—
Ware, G. W. W., M.B. ..	Sialkot, India .. ..	.. ..	—
Wyatt, C. J., M.B. .. ..	Blakan Mati, S. Setts. .. ..	.. ..	—
White, C. F., M.B. .. ..	Darjeeling, India .. ..	.. ..	—
Young, A. H. O. .. ..	St. George's, Bermuda .. ..	Officer in charge Women and Children	—

## LIEUTENANTS.

Archibald, R. G., M.B. ..	Uganda .. ..	.. ..	—
Amy, A. C., M.B. .. ..	Ranikhet, India .. ..	.. ..	—
Avis, W. G. .. ..	York .. ..	Training Special Reserves .. ..	—
Andrews, L. A. A. .. ..	Curepipe, Mauritius .. ..	.. ..	—
Bond, A. H. .. ..	Rangoon, India .. ..	.. ..	—
Benett, A. M. .. ..	Jubbulpore, India .. ..	.. ..	—
Bradish, F. L. .. ..	Jullundur, India .. ..	.. ..	—
Bracken, G. P. A. .. ..	Secunderabad, India .. ..	.. ..	—
Boyce, W. W. .. ..	Lahore Cantnmt., India ..	.. ..	—
Bell, W. J. E., M.B. ..	Victoria, S. China .. ..	.. ..	—
Bowle, C. W. .. ..	Dalhousie, India .. ..	.. ..	—
Bennett, J. A., M.B. ..	Mhow, India .. ..	.. ..	—
Browne, W. T. .. ..	Kamptee, India .. ..	Officer in charge Cantnmt. Hosp.	—
Beaman, W. K. .. ..	Crete .. ..	.. ..	—
Boyd, J. E. M. .. ..	Ferozepore, India .. ..	.. ..	—
Byatt, H. V. B. .. ..	Bulford .. ..	.. ..	—
Blake, H. H., M.B. ..	Stobs and Hawick .. ..	Officer in charge Field Hospital ..	—
Bradley, F. H., M.B. ..	Edinburgh .. ..	.. ..	—
Burney, W. H. S. .. ..	.. ..	Seconded with Egyptian Army ..	—
Buist, D. S., M.B. ..	Woolwich .. ..	.. ..	—
Bevis, H. .. ..	Curragh .. ..	.. ..	—
Ryrne, A. W., M.B. ..	Preston .. ..	.. ..	—
Benson, C. T. V. .. ..	.. ..	On probation .. ..	—
Bevis, A. W. .. ..	.. ..	.. ..	—
Beckton, J. .. ..	.. ..	.. ..	—

Name.	Station.	Appointment.	Specialist Certifi- cates in
Cummins, A. G., M.B.	Trincomali, Ceylon	Officer in charge Military Hospital	—
Caddell, E. D., M.B.	Bangalore, India	.. .. .	—
Corbett, D. M., M.B.	Dagshai, India	.. .. .	—
Cooke, O. C. P.	Colaba, India	.. .. .	—
Coutts, D., M.B.	Cawnpore, ..	.. .. .	—
Cassidy, C.	Greenham Common Camp	.. .. .	—
Chapman, F. H. M.	Bulford	.. .. .	—
Carruthers, V. T., M.B., F.R.C.S.Eng.	Trincomali, Ceylon	Officer in charge Military Hospital	—
Casement, F., M.B.	Naini Tal, India	.. .. .	—
Conyngham, C. A. T., M.B.	Curragh	Anæsthetist	—
Carson, H. W., M.B.	Manchester	Officer in charge Military Hospital	—
Collett, G. G.	.. .. .	On probation	—
Clark, J. A., M.B.	.. .. .	.. .. .	—
Clarke, C., M.B.	Shorncliffe	Offi. in charge Pathological Lbty.	—
Cunningham, F.W.M., M.B.	.. .. .	On probation	—
Dunne, J. S.	Agra, India	.. .. .	—
Drew, C. M., M.B.	.. .. .	Egyptian Army	—
De la Cour, G., M.B., B.S.	Peshawar, India	.. .. .	—
Dawson, A., M.B.	Wellington, India	.. .. .	—
Dill, M. G., M.B.	Chatham	.. .. .	—
Denyer, C. H.	Calcutta, India	Specialist in Dermatology 8th Div. and in charge Bgde. Laboratory	—
Dickson, H. S.	Bulford	.. .. .	—
Dawson, G. F., M.B.	Colchester	.. .. .	—
Dickenson, R. F. O'T.	Cork	Anæsthetist	b.
Dowling, F. T., M.B.	Wedgnoek Camp	Officer in charge Troops	—
Dunn, W. J., M.B.	Bury St. Edmunds	.. .. .	—
Dalgleish, F. B.	Durrington Camp	Offi. in charge Observation Hosp.	—
Dickson, R. M., M.B.	Glencorse	Officer in charge Military Hospital	—
Davis, A. H. T.	Lichfield	.. .. .	—
Dykes, S. S., M.B.	.. .. .	On probation	—
Egan, W., M.B.	Multan, India	.. .. .	—
Edmunds, C. T.	Peshawar, India	.. .. .	—
Edwards, G. B.	Port Louis, Mauritius	Officer in charge Military Hospital	—
Elliot, E. J., M.B.	Tientsin, N. China	.. .. .	—
Elliot, A. C., M.B.	Sialkot, India	.. .. .	—
Ellcome, J. E.	Fort Tregantle	Officer in charge Military Hospital	—
Eves, T. S., M.B.	Maryboro' Heath Camp	.. .. . N.D. Hospital	—
Elvery, P. G. M.	.. .. .	On probation	—
Edwards, H. R.	.. .. .	.. .. .	—
Forrest, F.	Multan, India	.. .. .	—
Forsyth, W. H., M.B.	Middelburg, C.C., S. Africa	.. .. .	—
Foster, J. R.	Mhow, India	.. .. .	—
Fraser, A. D., M.B.	.. .. .	Seconded under Colonial Office	—
Fortescue, A., M.B.	Netley	With Special Reserves	—
Field, S.	Somaliland	.. .. .	—
Farebrother, H. W.	Malappuram, India	Officer in charge Military Hospital	—
Foster, A. L.	Aldershot	.. .. .	—
Fraser, A. E. G.	Cairo, Egypt	.. .. .	—
Franklin, C. L., M.B.	.. .. .	On probation	—
Gotelee, H. E.	Diyatalawa, Ceylon	Officer in charge Military Hospital	—
Galwey, W. R., M.B.	Willsworthy Camp	.. .. .	b.
Gillatt, W. H., M.B.	.. .. .	Egyptian Army	—
Gibson, L. G.	Jullundur, India	.. .. .	—
Gibbon, E., M.B.	Cairo, Egypt	.. .. .	—
Galgey, R. C.	Port Royal, Jamaica	.. .. .	—
Gibson, H. G.	Valetta, Malta	.. .. .	—
Gurley, J. H.	Alexandria, Egypt	.. .. .	—
Gibson, H.	Wool Camp	Officer in charge Military Hospital	—
Gregg, R. G. S., M.B.	Oranmore Camp	.. .. . N.D. Hospital	—
Graut, J. F., M.B.	Fermoy	.. .. .	—
Gall, H.	Dover	.. .. .	—

Name.	Station.	Appointment.	Specialist Certifi- cates in
Honeybourne, V. C.	Rawalpindi, India	Officer in charge N.D. Hospital	—
Howell, F. D. G.	Chakrata, India	Staff Surgeon	—
Heslop, A. H., M.B.	Gharial, India	.. .. .	—
Howell, H. L.	Ahmednagar, India	.. .. .	—
Hart, J. C., M.B.	Tientsin, N. China	Officer in charge Military Hospital	—
Hanafin, J. B., F.R.C.S.I.	Glenbeigh Camp	.. .. . N.D. Hospital	—
Hingston, J. C. L.	Edinburgh..	Training Special Reserve, R.A.M.C.	—
Hart, H. P., M.B.	Woolwich ..	Anæsthetist	—
Hendry, A., M.B.	Rolleston Camp	.. .. .	—
Harding, C. E. L., M.B.	Poona, India	.. .. .	—
Houston, J. W., M.B.	Curragh ..	.. .. .	—
Hewson, F. M.	" ..	.. .. .	—
Hill, J. R., M.B.	" ..	On probation	—
Johnson, V. G.	Peshawar, India	Staff Surgeon	—
Johnson, B.	Wellington, India	.. .. .	—
Jacob, A. H.	Rawalpindi, India	.. .. .	—
Jones, A. E. B., M.D.	Canterbury	.. .. .	—
James, J., M.B.	Woolwich ..	.. .. .	—
Jones, J. B., M.B.	Magilligan Camp	Officer in charge N.D. Hospital	—
Joynt, H. F., M.B.	" ..	On probation	—
Kelly, C., M.B.	Secunderabad, India	.. .. .	—
Kavanagh, E. J., M.B.	Bareilly, India	.. .. .	—
King, R. de V.	Aldershot ..	Anæsthetist, Connaught Hospital	—
Keane, G. J., M.D.	Uganda ..	Seconded under Colonial Office	b.
Kyle, S. W., M.B.	Dublin ..	.. .. .	—
Littlejohns, A. S.	Pretoria, S. Africa	.. .. .	—
Leslie, T. C. C.	Maritzburg, S. Africa	Anæsthetist	—
Lathbury, E. B.	Nasirabad, India	.. .. .	—
Leslie, R. W. D.	Cottnera, Malta	.. .. .	—
Lochrin, M. J.	Bangalore, India	.. .. .	—
Lunn, W. E. C., M.B.	Lahore Cantonment, India	.. .. .	—
Loughnan, W. F. M.	Bareilly, India	.. .. .	b.
Leahy, M. P., M.B.	Curragh ..	.. .. .	—
Langrishe, J. du P., M.B.	Mhow, India	Attached to 6th Dragoons for Anti-typhoid Treatment	—
Lloyd, J. R.	Chester ..	.. .. .	—
Leckie, M.	Chatham ..	With Special Reserve	—
Leeson, H. H.	" ..	On probation	—
Lane, J. W., M.D.	Dublin ..	.. .. .	—
Lambkin, E. C., M.B.	" ..	On probation	—
McCammon, F. A., M.B.	Quetta, India	.. .. .	—
Morris, C. R. M., M.B.	Sialkot, India	.. .. .	—
Mulligan, J. B. G.	Imtarfa, Malta	.. .. .	—
Mitchell, W., M.B.	Sabathu, India	.. .. .	—
McCarthy, D. T., M.B.	Meerut, India	.. .. .	—
Mackenzie, D. F., M.B.	Lebong, India	.. .. .	p.
Middleton, E. M.	Rawalpindi, India	.. .. .	—
McEwen, O. R.	Khyra Gali, India	Officer in charge Military Hospital	—
McGrigor, D. B., M.B.	Chatham ..	.. .. .	—
Murphy, L.	Lodmoor Camp	.. .. .	—
McQueen, C.	Queenstown	.. .. .	—
McCombe, J. S., M.B.	Windmill Hill Camp	.. .. .	—
Marshall, W. E., M.B.	Millbank, London	.. .. .	—
McCreery, A. T. J., M.B.	Netley ..	.. .. .	—
McNeill, A. N. R., M.B.	Edinburgh..	.. .. .	—
Mitchell, T. J., M.B.	Barry Camp	.. .. .	—
McArthur, D. H. C., M.B.	Caterham ..	.. .. .	—
Manifold, J. A., M.B.	" ..	On probation	—
McArthur, W. P., M.B.	" ..	" ..	—
McSheehy, O. W., M.B.	" ..	" ..	—
Mathieson, W.	Newcastle-on-Tyne	" ..	—
Newman, R. E. U., M.B.	Sialkot, India	.. .. .	—
Nicholls, T. B., M.B.	Cosham ..	.. .. .	—

Name.	Station.	Appointment.	Specialist Certificates in
Nolan, R. H. .. ..	.. ..	On probation .. ..	.. ..
O'Carroll, A. D., M.B. ..	Dagshai, India .. ..	.. ..	.. ..
O'Neill, E. M., M.B. ..	Jhansi, India .. ..	.. ..	.. ..
O'Grady, D. De C. ..	Peshawar, India .. ..	.. ..	.. ..
O'Keeffe, J. J., M.B. ..	Hyderabad, India .. ..	.. ..	.. ..
O'Connor, R. D. ..	Kasauli, India .. ..	.. ..	.. ..
O'Farrell, W. R. ..	Rochester Row, London ..	.. ..	.. ..
Odlum, B. A. ..	Tidworth .. ..	.. ..	.. ..
O'Brien-Butler, C. P. ..	Limerick .. ..	.. ..	.. ..
O'Kelly, R. ..	Ewshott .. ..	Officer in charge Detention Hosp. ..	.. ..
O'Rourke, C. H., M.B. ..	Curragh .. ..	" " Path. Laboratory ..	.. ..
O'Riordan, W. H. ..	.. ..	On probation .. ..	.. ..
Paine, E. W. M. ..	Calicut, India .. ..	Officer in charge Military Hospital ..	.. ..
Phelan, E. C., M.B. ..	Calcutta, India .. ..	.. ..	.. ..
Purdon, W. B., M.B. ..	Rangoon, India .. ..	.. ..	.. ..
Perry, H. M. J. ..	Victoria, S. China .. ..	.. ..	.. ..
Phillips, T. McC., M.B. ..	Finner Camp .. ..	Officer in charge N.D. Hospital ..	.. ..
Petit, G. ..	Larkhill .. ..	" " Observatn. Hosp. ..	.. ..
Pollard, A. M. ..	Cosham .. ..	.. ..	.. ..
Parkinson, G. S. ..	Dunree Camp .. ..	Officer in charge N.D. Hospital ..	.. ..
Pottinger, D. E. C., M.B. ..	Piershill and Leith Fort ..	" " Troops .. ..	.. ..
Parsons-Smith, E. M. ..	.. ..	On probation .. ..	.. ..
Priest, R. C., M.B. ..	.. ..	" .. ..	.. ..
Paris, R. C. ..	.. ..	" .. ..	.. ..
Robinson, T. T. H., M.B. ..	Mhow, India .. ..	.. ..	.. ..
Rudkin, G. F. ..	Wellington, India .. ..	.. ..	.. ..
Renshaw, J. A. ..	Eastbourne .. ..	.. ..	.. ..
Rigby, C. M. ..	Dover .. ..	.. ..	.. ..
Ryles, C., M.B. ..	Chatham .. ..	.. ..	.. ..
Ranken, H. S., M.B. ..	.. ..	On probation .. ..	.. ..
Roche, J. J. D., M.B. ..	.. ..	" .. ..	.. ..
Rennie, W. B., M.B. ..	.. ..	" .. ..	.. ..
Sutcliffe, A. A., M.B. ..	Blakan Mati, Str. Setts. ..	.. ..	.. ..
Sampson, P. ..	Jhansi, India .. ..	.. ..	.. ..
Scott, J. W. L. ..	Quetta, India .. ..	.. ..	.. ..
Smales, W. C. ..	Poona, India .. ..	Officer in charge Cntnmt. Hosp. ..	.. ..
Stewart, P. S., M.B. ..	Cottonera, Malta .. ..	.. ..	.. ..
Sexton, T. W. O. ..	Standerton, S. Africa ..	Officer in charge N.D. Hospital ..	.. ..
Stevenson, G. H., M.B. ..	Ambala, India .. ..	" " Bde. Laboratory ..	.. ..
Spencer, J. H., M.B. ..	Gibraltar .. ..	.. ..	.. ..
Sim, J. A. B., M.B. ..	Warwick Camp, Bermuda ..	Officer in charge Troops .. ..	.. ..
Scaife, C., M.D. ..	Kirkee, India .. ..	.. ..	b.
Scott, T. H., M.B. ..	Dalhousie, India .. ..	Medical Offi. Dalhousie—Pathan- cote Road .. ..	.. ..
Stuart, F. J., M. B. ..	Sheerness .. ..	.. ..	.. ..
Spong, W. A., M.B. ..	York .. ..	.. ..	.. ..
Suhr, A. C. H., M.B. ..	R.A.M. College .. ..	.. ..	.. ..
Stevenson, A. L., M.B. ..	Dublin .. ..	.. ..	.. ..
Shepherd, A., M.B. ..	Sheffield .. ..	.. ..	.. ..
Saunders, S. M. ..	Woolwich .. ..	.. ..	.. ..
Sherlock, C. G., M.D. ..	Dublin .. ..	.. ..	.. ..
Startin, J. ..	Deeptut and Blackdown ..	.. ..	.. ..
Somers-Gardner, F. H., M.B. ..	Churn Camp .. ..	.. ..	.. ..
Stack, G. H., M.B. ..	Aldershot .. ..	.. ..	.. ..
Stirling, A. D., M.B. ..	.. ..	On probation .. ..	.. ..
Tate, R. G. H., M.D. ..	Umbala, India .. ..	.. ..	b.
Thompson, W. I., M.B. ..	Lucknow, India .. ..	.. ..	.. ..
Turner, F. T. ..	Poona, India .. ..	.. ..	.. ..
Todd, R. E., M.B. ..	Pirbright .. ..	.. ..	.. ..
Treves, H. T. ..	Uganda .. ..	Seconded under Colonial Office ..	.. ..
Tobin, W. J. ..	Longmoor .. ..	.. ..	.. ..
Tomlinson, P. S. ..	.. ..	On probation .. ..	.. ..



Name.	Station.	Appointment.	Specialist Certi- ficates in
Taylor, G. P., M.B.	.. ..	On probation .. ..	—
Vidal, A. C.	.. .. Cosham .. ..	.. ..	—
Varvill, B.	.. .. Burghclere Camp .. ..	Officer in charge Observatn. Hosp.	—
Vaughan, E. V., M.B.	.. .. Queenstown .. ..	.. ..	—
Williams, A. S.	.. .. Dinapore, India .. ..	.. ..	—
Wood, J. L.	.. .. Bareilly, India .. ..	Staff Surgeon .. ..	—
Wilson, M. O., M.B.	.. .. Belgaum, India .. ..	.. ..	—
Wells, A. G.	.. .. Lahore, India .. ..	.. ..	—
Worthington, F.	.. .. Colchester .. ..	With Special Reserves .. ..	—
Walker, S. G., M.B.	.. ..	.. ..	—
Wright, W. G.	.. .. Netley .. ..	.. ..	—
Wright, A. R., M.B.	.. .. Aldershot .. ..	.. ..	—
White, M., M.B.	.. ..	On probation .. ..	—
Williamson, M. J., M.B.	.. ..	.. ..	—
Winder, A. S. M., M.B.	.. ..	.. ..	—
Yourell, J. R., M.B.	.. ..	.. ..	—

## MEDICAL OFFICERS OF THE HOUSEHOLD CAVALRY.

Rank.	Name.	Regiment.	Station.	Specialist Certi- ficates in
Surg.-Lieutenant-Colonel	Deeble, B. W. C.	.. 1st Life Guards ..	Hyde Park	—
Surgeon-Major	Power, J. H.	.. 2nd Life Guards ..	Windsor	—
"	Pares, B.	.. Royal Horse Guards ..	Regent's Park	—
Surgeon-Captain	Cowie, R. M.	.. 2nd Life Guards ..	Windsor	—
"	Bodington, P. J., M.B.	.. Royal Horse Guards ..	Regent's Park	—
"	Lupton, A. C., M.B.	.. 1st Life Guards ..	Hyde Park	—

## MEDICAL OFFICERS OF THE BRIGADE OF GUARDS.

Brig.-Surg.-Lieut.-Col.	Harrison, C. E., C.V.O.,	Grenadier Guards	.. Millbank,	—
(Brevet-Colonel)	M.B., F.R.C.S.Eng.,			
	K. H. S.		London	
Surg.-Lieutenant Colonel	Crooke-Lawless, W. R.,	Coldstream Guards	.. On Staff of	—
	M.D., C.I.E.		Viceroy of	
			India	
"	Bateson, J. F., M.B.	"	.. Windsor	—
Surgeon-Major	Whiston, P. H.	.. Irish Guards ..	.. Caterham	b.

## QUARTERMASTERS.

Rank.	Name.	Present Station.	Date of last arrival home or embarkation for Abroad
Hon. Major	Merritt, G.	.. Cape Town, S. Africa ..	.. 24 12 1904
"	Beach, J. H. W.	.. London ..	.. 2 5 1903
"	Hirst, J.	.. Cosham ..	.. 30 8 1902
"	Goater, B.	.. Liverpool ..	.. 5 7 1903
"	Lines, E.	.. Darlington ..	.. 21 10 1907
" Capt.	Crawley, C.	.. Egypt ..	.. 11 5 1903
"	Brake, T. F.	.. Dublin ..	.. 22 5 1902
"	Short, J. B.	.. London ..	.. 13 6 1907
"	Hasell, H. G.	.. Woolwich ..	.. 13 12 1902
"	Allen, G. L.	.. Curragh ..	.. 9 3 1908
" Major	Bruce, A.	.. Woolwich ..	.. 12 2 1904
" Capt.	Macintosh, P.	.. Edinburgh ..	.. 13 9 1902
"	Hawkey, R.	.. Birmingham ..	.. 15 11 1902
"	Whitehorn, J. C. B.	.. Cork ..	.. 24 3 1902
"	Painton, G. H.	.. London ..	.. 13 9 1902
" Lieut.	Brook, H. S.	.. Scottish Command ..	.. 16 4 1909
"	Spackman, H.	.. S. Africa ..	.. 17 11 1905

Rank	Name.	Present Station.	Date of last arrival home or embarkation for Abroad.
Hon. Lieut.	Chalk, A. J.	Chatham	22 11 1902
" "	Green, J.	Malta	19 2 1908
" "	Talbot, W. J. C.	York	27 12 1902
" "	Moss, E. P.	Lichfield	23 9 1905
" "	Essox, B. E.	Egypt	8 1 1907
" "	McClay, J.	Woolwich	31 1 1905
" "	Short, G. F.	Dublin	11 3 1908
" "	Woolley, H.	Dover	9 3 1908
" "	Glennon, J.	Hong Hong	31 10 1907
" "	Hall, F. W.	Aldershot	6 12 1902
" "	Morrison, A.	Malta	24 9 1907
" "	Attwood, J.	Cosham	13 12 1902
" "	Duncan, W.	Netley	18 9 1902
" "	Bruce, F.	Dublin	19 11 1900
" "	Holway, W. G.	Woolwich	1 4 1908
" "	Offord, E. P.	Gibraltar	13 2 1908
" "	Audus, H. J. F.	Aldershot	11 3 1900
" "	Conolly, J. B.	S. Africa	27 11 1907
" "	Houghton, E.	Belfast	6 12 1902
" "	Scott, R.	Netley	21 10 1907
" "	Wilson, A.	Devonport	29 1 1908
" "	Glover, H. W.	Aldershot	6 5 1901
" "	Exton, T.	Tidworth	29 8 1902
Captain	Crookes, F.	Devonport	10 12 1904
Lieut.	Cowan, R. R.	Shorncliffe	19 12 1903
" "	Benson, G. A.	N. China	31 10 1907
" "	Wakefield, H. P.	Southampton	15 4 1905
" "	Jacomb, T. J.	Aldershot	22 8 1907
" "	Wheeler, A.	Depôt	10 2 1905
" "	Pilgrim, A. J.	Malta	24 9 1907
" "	Lunney, A.	Tidworth	10 2 1905
" "	Clapshaw, A.	Edinburgh	2 10 1902
" "	Archibald, W. N.	Colchester	14 2 1908
" "	Watkins, J.	Chester	15 4 1905
" "	Gillman, J.	Netley	15 4 1905
" "	Cope, T. F.	"	21 9 1904
" "	Osborne, J. W.	S. Africa	27 5 1895

<sup>1</sup> Specialist Certificate in Skiagraphy.

#### RETIRED MEDICAL OFFICERS OF THE REGULAR ARMY WHO ARE EMPLOYED.

Name.	Station where Employed.
Lieut.-Col. A. G. Kay, M.B.	Clifton, Bristol.
Lieut.-Col. J. D. Crowe (Hon. Brig.-Surg.)	Weymouth.
Lieut.-Col. H. H. Stokes, M.D.	Oxford.
Capt. H. Cotton	Ipswich.
Lieut.-Col. J. G. Williamson	Leicester.
Lieut.-Col. J. A. Gormley, M.D.	Kingston.
Col. A. L. Browne, M.D.	Taunton.
Lieut.-Col. H. Scott, M.B.	London.
Col. W. A. Parker	Penally.
Lieut.-Col. L. B. Ward	Coventry.
Lieut.-Col. W. Finlay	Jersey.
Lieut.-Col. H. Charlesworth, C.M.G.	Nottingham.
Lieut.-Col. G. F. Poynder	Bedford.
Lieut.-Col. J. Tidbury, M.D.	Royal Military College.
Lieut.-Col. H. L. Battersby	Bodmin.
Lieut.-Col. C. G. D. Mosse, F.R.C.S.I.	Guernsey.
Major H. S. Peeke	Derby.

Name.	Station where Employed.
Major J. F. Burke .. .. .	Lancaster.
Lieut.-Col. T. B. A. Tuckey .. .. .	Detention Barracks, York.
Lieut.-Col. W. G. Clements .. .. .	Christchurch.
Lieut.-Col. A. Baird, M.B. .. .. .	Worcester.
Lieut.-Col. J. Riordan, M.B. .. .. .	Clonmel.
Major E. H. Myles, M.B. .. .. .	Guernsey.
Surg.-Lieut.-Col. G. S. Robinson .. .. .	Eastbourne.
Major S. Butterworth .. .. .	Carlisle.
Lieut.-Col. G. T. Trewman .. .. .	Reading.
Lieut.-Col. J. Osburne .. .. .	Galway.
Lieut.-Col. E. M. Wilson, C.B., C.M.G., D.S.O. .. .. .	Record Office, Aldershot.
Major A. E. C. Spence, M.B. .. .. .	Warwick.
Major B. F. Zimmermann .. .. .	Topsham, Exeter.
Major R. J. McCormack, M.D. .. .. .	Omagh.
Major R. I. Power .. .. .	Waterford.
Lieut.-Col. T. Archer .. .. .	Lydd.
Lieut.-Col. U. J. Bourke, M.B. .. .. .	Hamilton.
Lieut.-Col. G. E. Moffet, M.B. .. .. .	Perth.
Lieut.-Col. F. J. Greig .. .. .	Stirling.
Lieut.-Col. J. Kearney, M.D. .. .. .	Wrexham.
Major J. P. S. Hayes .. .. .	Gravesend.
Lieut.-Col. T. H. Corkery .. .. .	Exeter.
Lieut.-Col. R. W. Barnes .. .. .	Dorchester.
Lieut.-Col. M. J. Whitty, M.D. .. .. .	Liverpool.
Lieut.-Col. C. J. W. Tatham .. .. .	Scarborough.
Lieut.-Col. J. M. Nicolls, M.B. .. .. .	Detention Barracks, Cork.
Lieut.-Col. W. S. Dowman .. .. .	Northampton.
Major G. A. Wade .. .. .	Horfield.
Capt. J. T. Clapham .. .. .	Landguard Fort.
Major C. W. Allport, M.D. .. .. .	Great Yarmouth.
Lieut.-Col. C. R. Woods, M.D. .. .. .	Birr.
Major A. Wright .. .. .	Falmouth.
Lieut.-Col. A. W. Browne .. .. .	Armagh.
Major V. H. W. Davoren .. .. .	Bury St. Edmunds.
Major H. V. Dillon .. .. .	Trowbridge.
Lieut.-Col. A. Hosie .. .. .	Sandown.
Major J. D. Moir .. .. .	Fort Efford and Mutley District.
Lieut.-Col. G. Coutts .. .. .	Chichester.
Major G. M. Dobson .. .. .	Shrewsbury.
Major W. J. Trotter .. .. .	Naas.
Lieut.-Col. W. Rowney, M.D. .. .. .	Manchester.
Colonel J. Magill, C.B., M.D. .. .. .	Staff-Officer to A.M.O., 2nd London Division Territorial Force.
Lieut.-Col. J. D. T. Reckitt .. .. .	Staff-Officer to A.M.O., 1st London Division Territorial Force.
Lieut.-Col. E. O. Wight .. .. .	Staff-Officer to A.M.O., Home, Counties Division Territorial Force.
Major E. C. Freeman, M.D. .. .. .	Staff-Officer to A.M.O., East Anglian Division Territorial Force.
Lieut.-Col. G. Scott, M.B. .. .. .	Staff-Officer to A.M.O., Highland Division Territorial Force.
Lieut.-Col. L. Haywood, M.B. .. .. .	Staff-Officer to A.M.O., South Midland Division Territorial Force.

# JOURNAL

OF THE

## ROYAL ARMY MEDICAL CORPS.

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### Corps News.

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JULY, 1909.

#### ROYAL ARMY MEDICAL CORPS.

Lieutenant-Colonel John Carmichael is placed on retired pay, dated May 5, 1909. He entered the Service July 30, 1881, became Surgeon-Major, Army Medical Staff, July 30, 1893; Lieutenant-Colonel, Royal Army Medical Corps, July 30, 1901.

Lieutenant Walter H. S. Burney is seconded for Service with the Egyptian Army, dated April 1, 1909.

Lieutenant-Colonel Alexander S. Rose, M.D., retires on retired pay, dated May 26, 1909. He entered the Service February 5, 1881; became Surgeon-Major, Army Medical Staff, February 5, 1893; Lieutenant-Colonel, Royal Army Medical Corps, February 5, 1901; Lieutenant-Colonel, Royal Army Medical Corps, under Art. 365, Pay Warrant, January 8, 1906. His war services are as follows: Egyptian Expedition, 1882-84. medal; bronze star. Soudan, 1884, clasp. Soudan Expedition, 1885, Suakin, clasp. South African War, 1899-1902, Relief of Ladysmith, including action at Colenso; operations of January 17 to 24, 1900, and action at Spion Kop; operations of February 5 to 7, 1900; and action at Vaal Kranz (severely wounded). Despatches, Lond Gaz, February 1, 1901. Queen's Medal with 2 clasps; King's Medal with 2 clasps.

Captain James M. Buist, M.B., is placed temporarily on the Half-Pay List on account of ill-health, dated June 4, 1909.

**ARRIVALS HOME ON LEAVE.**—From India: Lieutenant-Colonels S. F. Freyer, C.M.G., and T. J. R. Lucas; Lieutenant A. M. Benett (sick). From Egypt: Major P. Evans; Captain R. C. Hallows. From South Africa: Lieutenant-Colonel R. H. S. Sawyer. From West Africa: Major F. J. W. Porter, D.S.O..

**DIPLOMAS.**—The undermentioned officers have obtained the Diplomas in Public Health of the Royal College of Physicians and Surgeons, Ireland: Captains J. Dorgan (with honours), W. W. Browne, and N. D. Walker; Lieutenant R. F. O. T. Dickinson. Captain J. P. Murphy has obtained the Diploma in Public Health of the University of Liverpool. Captain H. P. W. Barrow has obtained the Diploma of Tropical Medicine of the University of Liverpool.

**INCREASED PAY.**—Lieutenant-Colonel R. J. Geddes, D.S.O., has been selected for increased pay of that rank, from May 26, 1909.

**POSTINGS.**—Captain C. A. J. A. Balck, Northern Command.

**APPOINTMENTS.**—Lieutenant-Colonel D. L. Irvine, as Recruiting Medical Officer, Leeds; Captain F. J. Palmer, Specialist in Operative Surgery, at Cork.

**EXCHANGES ON FOREIGN SERVICE ROSTER.**—Lieutenant-Colonel R. J. S. Simpson, C.M.G., and E. H. Lynden Ball.

Quartermaster and Honorary Major G. Meritt has been permitted to extend his tour of Service in South Africa until June, 1911.

The following retired pay appointments are vacant: Landguard Fort, Lincoln, Fort Staddon (Plymouth), Ayr, Belfast (recruiting).

The following appointments for Staff Officers to Administrative Medical Officers of the Territorial Force are vacant: Lowland Division, Northumbrian Division, West Riding Division, North Midland Division, East Lancashire Division, Wessex Division.

### PROMOTION.

16205 Lance-Serjeant H. Yeoman, March 29, 1909, to be Serjeant, special under para. 349, King's Regulations.

### LIST OF CASUALTIES:—

*Discharges.*—7308 Staff-Serjeant T. Devlin, May 24, 1909, after three months' notice; 9289 Staff-Serjeant F. Lyons, June 3, 1909, at his own request after eighteen years; 6362 Staff-Serjeant H. S. Goodchild, June 10, 1909, after three months' notice; 8423 Serjeant J. W. Matthews, May 28, 1909, medically unfit; 6281 Serjeant W. C. Slater, May 31, 1909, after three months' notice; 11485 Private J. S. Richards, May 27, 1909, termination first period; 19616 Private F. P. Hutchinson, May 31, 1909, termination of engagement, twenty-one years.

*Transferred to Army Reserve.*—255 Private F. Tophill, May 14, 1909; 15716 Private J. Whiffen, May 14, 1909; 15694 Private C. W. Bullen, May 17, 1909; 1033 Private W. O'Shea, May 20, 1909; 15711 Private J. Coupe, May 20, 1909; 15726 Private W. Hosker, May 23, 1909; 271 Private H. Parton, May 28, 1909; 273 Private H. E. Dibble, May 30, 1909; 280 Private P. Spillane, May 29, 1909; 277 Private H. H. Haynes, May 30, 1909; 282 Private A. Alexander, May 31, 1909; 281 Private J. F. Ashbury, May 29, 1909; 15753 Private W. Whitmee, May 30, 1909; 302 Private J. A. Heath, June 5, 1909; 15758 Private T. R. Ford, June 3, 1909; 289 Private W. Griffiths, June 5, 1909; 290 Private A. Willis, June 6, 1909; 297 Private A. H. Furlong, June 7, 1909.

*Transferred from other Corps.*—2259 Private S. W. Wilson, May 12, 1909, from Royal Munster Fusiliers; 2265 Private F. Saunders, May 3, 1909, from Duke of Cornwall's Light Infantry.

*Transferred to other Corps.*—16301 Serjeant E. A. Lane, May 8, 1909, to Colonial Government (Northern Nigeria); 8763 Lance-Serjeant H. Yeoman, March 29, 1909, to London University, Officers' Training Corps; 1632 Private J. Watters, May 26, 1909, to Royal Irish Fusiliers.

### DEATH.

2143 Private A. S. Watson, May 18, 1909, at Dover.

### THE FOLLOWING N.C.O.'s AND MEN HAVE QUALIFIED FOR PROMOTION IN THE VARIOUS CORPS EXAMINATIONS.

*For Quartermaster-Serjeant.*—10699 Staff-Serjeant B. D. Connolly, 10073 Staff-Serjeant W. Merchant, 11214 Staff-Serjeant W. E. Squire, 10932 Staff-Serjeant C. Ward.

*For Staff-Serjeant.*—14461 Serjeant A. Baker, 8609 Staff-Serjeant G. Cookson.

*For Serjeant.*—12617 Corporal J. R. Edwards.

*For Corporal.*—11153 Private S. Woods, 1076 Private F. C. Bowden, 10754 Private A. T. Cooper, 10992 Private W. Murray, 12362 Private T. Porter, 2046 Private F. J. Hammond, 18854 Private C. D. Forge, 14172 Private E. W. Livermore.

### THE FOLLOWING HAVE BEEN AWARDED FIRST-CLASS CERTIFICATES OF EDUCATION AT THE EXAMINATION HELD ON MARCH 30, 1909.

*Awarded Certificates.*—1406 Bugler F. H. Newland. 9940 Staff-Serjeant F. Davis, 10221 Staff-Serjeant E. Larnier, 8609 Staff-Serjeant G. Cookson, 12266 Serjeant H. Parker, 15670 Serjeant F. W. Goodread, 11528 Serjeant J. Bannister, 16507 Staff-Serjeant G. Martin, 1620 Private A. E. Pegg, 11453 Serjeant F. S. M. Jeph's, 11223 Serjeant J. F. Hampton, 12582 Serjeant J. Whiting, 11627 Serjeant H. Secker, 8269 Staff-Serjeant G. A. Gibbs, 19256 Private W. King, 12058 Serjeant A. W. Pettley, 1032 Private E. Mean, 19838 Private R. Tothill.

*Passed in Group I.*—17210 Corporal C. E. James, 19688 Private T. V. Falkingham, 1856 Private A. F. Leaney, 14464 Serjeant G. F. Hurren, 1344 Private W. C. Shelley, 18912 Serjeant H. Dawson, 1859 Bugler W. N. Collier, 1118 Bugler H. W. Reeves, 925 Private C. Lomas, 19444 Private H. A. Jones, 14503 Serjeant G. Pottinger.

*Passed in Group II.*—18940 Private H. Cooper, 19146 Private C. F. Keyte, 12340 Serjeant T. Butler, 16287 Serjeant W. E. Saunders.

**NOTES FROM FORT PITT.**—An impromptu Smoking Concert took place in the N.C.O.'s Mess, Fort Pitt, Chatham, on Monday last, the 7th of June, it being a farewell and presentation to Serjeant Davey, R.A.M.C., on his retirement from the Service after completing twenty-one years. The chair was taken by Serjeant-Major H. J. Ford, R.A.M.C., and the programme, as under, left nothing to be desired. Just before the close of the first part, Serjeant-Major Ford rose and made a brief but kindly speech with regard to his knowledge of Serjeant Davey, and then presented him with two beautiful gold-mounted umbrellas (one for himself and one for Mrs. Davey, suitably inscribed), which were subscribed for by the members of the mess as a mark of their esteem for him, after which the health of Serjeant and Mrs. Davey was drunk with musical honours. Serjeant Davey responded with some very touching remarks regarding the happy days he had spent in the Corps, and assured everyone present that he was sorry he had to leave us, but, as he stated, "the best of friends must part." The concert proved a thorough success in every way, and great praise is due to the Committee (Serjeants Thompson and Glenny, and Corporal Forde) for the excellent manner in which they catered for everyone. The "King" being sung at 10.45 p.m., the N.C.O.'s retired to their respective quarters after a thoroughly good evening's enjoyment.

#### PROGRAMME.

##### PART I.

<i>Pianoforte Solo</i>	..	..	..	"Grand Finale" ..	..	Sergt.-Major FORD.
<i>Song</i>	..	..	..	"Last Roll Call" ..	..	..Corporal NICHOLAS.
<i>Recitation</i>	..	..	..	"Jessie" ..	..	.. Corporal FORDE.
<i>Song (with feeling)</i>	..	..	..	"Never no more" ..	..	Staff-Sergt. KERSTEIN.
<i>Comic Song</i>	..	..	..	"How They Pull My Leg" ..	..	Corporal MUSCETTELL.
<i>Song</i>	..	..	..	"Dandy Fifth" ..	..	.. Corporal HARLEN.
<i>Banjo Solo</i>	..	..	..	"I'm Tired" ..	..	.. Corporal GIBSON.
<i>Stump Speech</i>	..	..	..	"I only chanced it once" ..	..	.. Sergt. THOMPSON.
<i>Song</i>	..	..	..	"I'm still on the Active List" ..	..	.. Sergt. GLENNY.
<i>Song</i>	..	..	..	"The Golden Dustman" ..	..	.. Sergt. WRIGHT.
(by request)						

##### PART II.

<i>Pianoforte Solo</i>	..	..	..	"Nothing" ..	..	Staff-Sergt. ALLFORD.
<i>Song</i>	..	..	..	"Back to the Land" ..	..	.. Sergt. DAVEY.
<i>Song</i>	..	..	..	"I can't change it" ..	..	.. Mr. BARNES.
<i>Song</i>	..	..	..	"The Galloping Major" ..	..	.. Sergt. HUGHES.
<i>Song</i>	..	..	..	"No. 9, and Sue, Sue, Sue" ..	..	.. Sergt. WILKINSON.
<i>Recitation</i>	..	..	..	"Old Curiosity Shop" ..	..	.. Corpl. HOLDEN.
<i>Song</i>	..	..	..	"Pay, Pay, Pay" ..	..	.. Corpl. READING.
<i>Song</i>	..	..	..	"I wandered on as in a dream" ..	..	.. Corpl. ALLEN.
<i>Song</i>	..	..	..	"Juanita" ..	..	.. Corpl. HUGHES.
<i>Cake Walk</i>	..	..	..	.. ..	..	..Sergt. DAVEY and Corpl. FORDE.

"GOD SAVE THE KING."

**NOTES FROM GIBRALTAR.**—Lieutenant-Colonel T. du B. White writes: "Gibraltar news does not seem to have taken up much room in the Corps' Journal of late, perhaps because we live so much in a groove here that it takes a lot of shaking to dislodge us from our old rut, and by the time you have fallen into the ways of the place you cease to look upon anything as wildly exciting, and accept the daily routine as a philosopher.

"However, we lately had a 'Siege' here which lasted from April 19 to 30, and during that time, big gunfire was the order of the day and night.

"His Royal Highness the Field Marshal Commanding-in-Chief and High Commissioner of the Mediterranean, was to have arrived here about April 15, but His Majesty's visit to Malta necessitated a postponement, and, moreover, last year he inspected the fortress during mobilisation, and this time, no doubt, he wished to see the troops under peace conditions, and devoted his attention more particularly to the various regimental institutes, recreation rooms, &c., which are closed during mobilisation.

"His Royal Highness arrived in H.M.S. 'Aboukir' on May 19, and after inspecting the rest of the Station, visited the military hospital on May 21. He was received by Colonel H. W. Murray, Principal Medical Officer, and Lieutenant-Colonel C. E.

Faunce, Officer-in-Charge, who conducted him round the wards, where he took his usual kindly interest in each individual case. Having signed the special visitors' book (which is by degrees becoming a valuable collection of Royal autographs), His Royal Highness expressed himself highly pleased with everything, saying it was 'a beautiful hospital, beautifully kept.'

"Major Fowler, our Sanitary Officer, and Corporal Stanley, R.A.M.C., have been absent for some weeks on the British Mission to Fez, and are expected back in about ten days' time. During the former's absence Major Howell has been performing the sanitary work of the station.

"A large proportion of the nursing section sat recently for the certificate of training as a nurse, and they are now anxiously awaiting the publication of the results. It is very encouraging to their instructors to have so large a number as nine presenting themselves for examination, and good results are expected.

"The picnic season has commenced, and the early days of June will see the company taking their annual outings to the Cork Woods, a welcome change from the confined life of the Rock. I hope to give some account of these later on, as well as of cricket and the Garrison Athletic Sports, which take place on June 3 and 4, and for which some of our men are in training."

**NOTES FROM MALTA.**—The members of the Royal Army Medical Corps, Sergeants' Mess, Cottonera Military Hospital, invited their comrades of the 3rd Battalion King's Royal Rifles, to a garden party, when the gathering was brightened by a large attendance of the married families and children. The recreation ground attached to the hospital was furnished with all the elements of sport and pastime, the enjoyment of which was favoured by delightful weather. The usual Thursday afternoon band performance, which is given by kind permission of Colonel Chaplin and officers, 3rd King's Royal Rifles, was largely contributory to the success of the proceedings.

The attractions comprised the Mosquito, Mark III., flying machine, which was very popular until it shared the fate of the first Zeppelin. The Cottonera Fine Art Gallery was another novel and interesting feature, being a collection of objects furnishing practical illustrations of twenty of the world's best known pictures. By far the most favoured work was that of "A Good-looking Lassie," who was found in a mirror provided for the purpose.

Tennis was in operation during the afternoon, conjointly with ping-pong, puff billiards and small-arm practice, which shared like patronage. The little ones had their swings and kindred contrivances, although it was evident that the juvenile spirit possessed the entire party, especially apparent in the vigour and heartiness with which the old-time game of "Twos and Threes" was indulged in. Tea was served to the accompaniment of cake and tart of tempting excellence, very creditable to Mrs. Jones, who kindly undertook the catering; and generally superintended the department. To the exertions of Staff-Sergeant Storey, R.A.M.C., is due the success which marked this happy union of the medicals with their fast friends of the 3rd King's Royal Rifles.

Sergeant Adam McNeill, R.A.M.C., was presented with the medal for good conduct and long service, on a parade of the Corps at Cottonera Military Hospital.

Lieutenant-Colonel A. F. Russell, C.M.G., in making the presentation, congratulated the recipient and hoped that the good example would serve to emulate others in obtaining the distinction.

#### BOXING.

On May 17 and 18, the Army Boxing Championships were decided at the Britannia Circus, and it is very pleasing to be able to record that Private J. R. Dare, R.A.M.C., obtained the runner-up medal in the heavy-weight series. Private Dare had already won the Army middle-weight championship of Malta, 1908, but being 4 lb. over the middle-weight limit, he had to enter for the heavies, otherwise he would in all probability have continued to be the middle-weight champion.

In 1908 he was runner-up in the Army and Navy middle-weight championship, and although defeated in the third round, the local paper described the fight as the cleanest and most scientific bout of the evening.

Out of fourteen fights he has only lost four. Since Bandaman Rice, 4th Rifle Brigade, left Malta, Dare has been without any assistance, and as this partner was undefeated in Malta, Dare was able to make rapid strokes under his tuition.

In June, Private Dare will endeavour to add to his laurels, when he meets the best middle-weight of the 3rd King's Royal Rifle Corps in a fifteen-round contest.

**NOTES FROM POTCHEFSTROOM.**—Captain A. E. S. Irvine writes: "Since the last notes were published from this station, a most successful and enjoyable cricket

season has ended. The Garrison Cricket League caused great excitement and keen rivalry amongst all the teams, and until the last match was played it would have been difficult to forecast the winner, although our XI. were hot favourites from the commencement of the competition, and justified the confidence placed in them by winning the League and Cup.

"The Detachment XI. were only defeated on four occasions—one match was lost by 1 run, another by 3 runs, and after a very exciting and evenly contested game against 'B' Squadron, 4th Hussars (runners-up) we were beaten by 6 runs. However, later on in the season we had our revenge, and defeated all the teams in the League by substantial scores. As the season progressed our team vastly improved in every department of the game, and we became invincible when playing on our own ground.

"The winning of the Cup (which was won outright) was largely due to the ability and enthusiasm of our captain, Lieutenant-Colonel Maher, who proved himself to be an invaluable leader, and his consistent and patient batting on many occasions turned a possible defeat into victory. His 105 against 'C' Squadron, 4th Hussars, was an exceptionally fine performance, not a chance being given. Serjeant-Major Bollen, as usual, proved a tower of strength, being one of our best batsmen, while his skill as a bowler was always held in the highest esteem. Private Brown, our fast bowler, played havoc with the batsmen. At his best, he was almost unplayable. Lance-Corporal Jessop and Privates Hooper and Clements were also successful bowlers. Captain Moore played most consistent cricket, being a reliable scorer and also capturing many wickets.

"Our entire XI. were noted for their keenness and smart fielding, very few loose runs being scored against us. Privates Clements, Clarke and Smith deserve special mention for their smart fielding, and Private Thorn proved himself to be an excellent wicket-keeper.

"In the District League we vanquished the strong regimental teams of the 4th Hussars and 9th Lancers. The cricket season wound up with a match against the Rest of the Garrison XI., and a very pleasant and evenly-contested game ended in a win for the 'Rest of the Garrison' by 18 runs. At the conclusion of the game, Mrs. Marling, wife of General Marling, V.C., presented the Cup, and in a graceful speech congratulated our XI. on being the proud possessors of the trophy. General Marling also made a speech and joined in the general congratulations upon our success. In the evening a smoking concert was given to celebrate our victory, and was largely attended by the numbers of the various teams in the Garrison. Lieutenant-Colonel Maher in a humorous speech thanked the audience for their congratulations. The musical programme was exceptionally good. Captain Moore's song and humorous recitation were loudly applauded, and an encore was demanded. Many of our own detachment contributed to the programme, which was augmented by our friends in the other regiments in the camp, and a most enjoyable evening ended after singing 'Auld Lang Syne.'

"A most excellent concert was organised by Private Cove for the patients on March 20, 1909. Two sketches were performed by our own dramatic company, and their talent was thoroughly enjoyed. The 9th Lancers' comedians caused roars of laughter, their patter and humorous songs being most mirth-provoking. Many other friends in camp added to an excellent programme.

"There have been many changes in our detachment, the 'Braemar Castle' being responsible for depriving us of many of our friends. Lieutenant and Quartermaster Brook has gone home to England. Sisters MacPherson, Milne, Walker and Ridley have also left us, the two former going to England, Sister Walker to Pietermaritzburg, and Sister Ridley to Pretoria. Since their departure we have had the pleasure of welcoming Sister Moor and Staff-Nurses Howe and Gardner. The following N.C.O.'s and men have proceeded to England: Staff-Serjeants Bangert and James, Serjeant Wattson, Lance-Corporal Jessop, Privates Turner, Vivian, Robinson, Williams, Dean, Tracey, Chamberlain, Fordham, Clements and Smith.

"The hospital has now been reduced from 100 to 40 beds.

"The Artillery practice camp commences at the end of May, and the manoeuvres start early in July.

"The South African Golf Championship was held on the well-known Potchefstroom Golf Links during Eastertide. Captain McEntire, R.A.M.C., secured the second prize in the Military Handicap.

"The football season has commenced, but we cannot hope to emulate the good example of our cricket XI., as we have so few footballers amongst our detachment, many of our last year's team having gone home tour expired; but our men play a keen game and make a good fight against their sturdier and more skilled opponents.

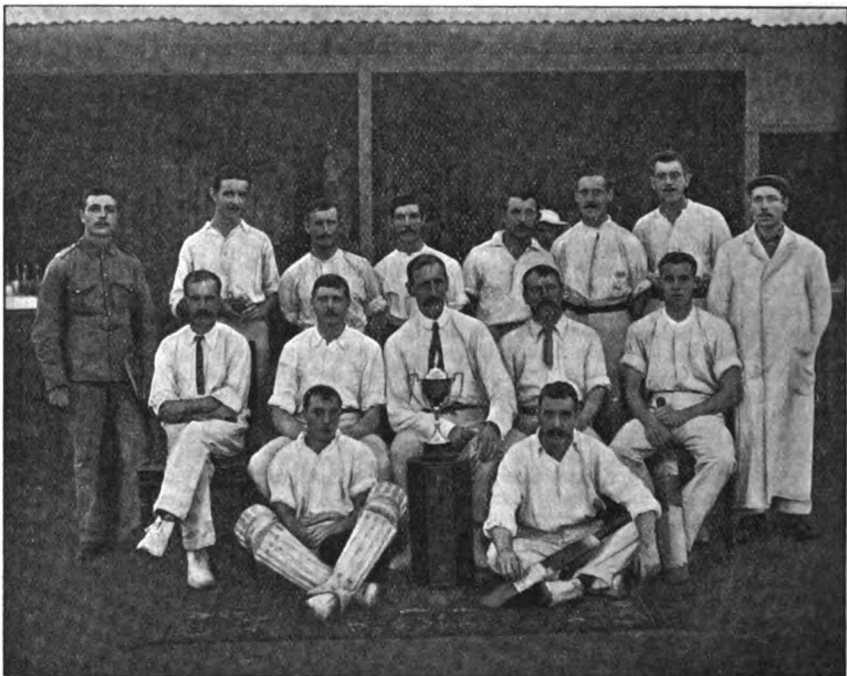


“At a meeting of the detachment, it was proposed by Serjeant-Major Bollen that the cricket cup should be forwarded to the Depôt Sergeants' Mess, Aldershot, where an opportunity will be given to many of our victorious XI. of seeing the cup which they did so much to win, and it will act as a reminder to them of Potchefstroom and their comrades, and of the many successful and exciting matches which they played against such sporting opponents. This suggestion was carried unanimously, and it was further proposed and decided that the Cup be taken by the ‘Braemar Castle’ party, in charge of Staff-Serjeant James and Serjeant Wattson.

“ Quartermaster-Serjeant Beaumont deserves special mention for his valuable services as Secretary to the Sports Club. On the cricket field he was remarkable as a smart fielder, and he brought off some fine catches, and on one occasion won an exciting match for us by a brilliant catch on the boundary.

"The league table, list of averages, programme of Patients' Concert, and photograph of the Cricket Team, are attached for insertion in the Corps' Journal."

Privates Bilbee (Scorer)	Brown	Wells	Vivian	Hooper Clements	Clarke	Warren (Umpire)
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**Q.M.S. Beaumont   Capt. Moore   Lt.-Col. Maher   Serj.-Maj. Bollen   Pte. Smith**  
**Pte. Thorn                                   Lce.-Cpl. Jessop**

POTCHEFSTROOM GARRISON CRICKET LEAGUE, 1908-1909.							
Teams	Played	Won	Drawn	Lost	Points	Points against	
Det. R.A.M.C. .. ..	18	14	—	4	10	—	
B Squadron 4th Hussars ..	18	13	1	4	9	—	
A Squadron 9th Lancers ..	18	10	4	4	6	—	
C Squadron 9th Lancers ..	18	11	2	5	6	—	
Royal Engineers.. ..	18	10	1	7	3	—	
A. S. C. .. ..	18	7	4	7	—	—	
C Squadron 4th Hussars ..	18	8	1	9	—	1	
B Squadron 9th Lancers ..	18	7	2	9	—	2	
Res. Squadron 9th Lancers ..	18	2	1	15	—	13	
A Squadron 4th Hussars ..	18	-	—	18	—	18	

One point is awarded for each win, nothing for a draw, and one point is deducted for each loss.

By kind permission of Lieutenant-Colonel J. Maher, R.A.M.C., the following variety entertainment was given in the hospital theatre on Saturday evening, March 20, 1909, commencing at 7.30 p.m. sharp:—

#### PROGRAMME.

##### Part I.

1. *Pianoforte Selection* .. .. . Pte. COCKAYNE, R.A.M.C.
2. *Serio Song* .. .. . "Country, King, and Girl" Pte. FENTON, 9th Lancers.
3. *Comic Song* "Everybody's in Love with a Girl" Lce.-Cpl. Forbester, 9th Lancers.
4. *Song* .. .. . "Would you Care?" .. .. . Pte. COVE, R.A.M.C.
5. *Comic Song* .. .. . "The Duke of Trafalgar Square" Pte. HAWKINS, 9th Lancers.
6. *Song* .. .. . "Lulu Mine" .. .. . Trpr. LLOYD, 9th Lancers.
7. *Comic Song* .. .. . "It's a Funny Feeling" Pte. DYKES, 9th Lancers.
8. *Song* .. .. . Selected .. .. . Pte. HACKMAN, 9th Lancers.
9. *Sketch* .. .. . "Ye Olde Red Lion" .. { Ptes. COVE, CHAMBERLAIN,  
WELLS, FREAME, R.A.M.C.

Interval of ten minutes.

##### Part II.

1. *Pianoforte Selection* .. .. . Pte. COCKAYNE, R.A.M.C.
2. *Character Song* .. .. . "Napoleon" Lce.-Cpl. DAVIDS, 9th Lancers.
3. *Song* .. .. . Selected .. .. . Capt. MOORE, R.A.M.C.
4. *Comic Song* "It's nice to know people who are kind" Pte. DYKES, 9th Lancers.
5. *Song* .. .. . Selected .. .. . Trpr. LLOYD, 9th Lancers.
6. *The Irish Comedians* .. .. . { Lce.-Cpl. FORBESTER, Pte.  
HAWKINS, 9th Lancers.
7. *Song* .. .. . Selected .. .. . Pte. FENTON, 9th Lancers.
8. SKETCH—"The Greed of Gold."

Scene I. Exterior of Country Inn.

Scene II. Interior, parlour, and lounge room of Inn.

CHARACTERS.—*Silas Holland*, innkeeper .. .. . Pte. COVE, R.A.M.C.  
*Frank Holland*, innkeeper's son .. .. . Pte. CHAMBERLAIN, "  
*Alfred Hinton*, friend of Frank .. .. . Pte. BERRY, "  
*Gamblers* { *Edwin Powell* .. .. . Pte. TURNER, "  
*Herbert Crutchley* .. .. . Pte. WELLS, "

PIANIST—Pte. COCKAYNE, R.A.M.C.

GOD SAVE THE KING.

#### BATTING AVERAGES FOR GARRISON LEAGUE MATCHES.

Name	No. of innings	Times not out	Total runs	Most in an innings	No. of matches	Average
Leut.-Col. Maher .. ..	22	1	538	105	15	25·61
Capt. Moore .. ..	21	2	483	81	15	25·41
Serjt.-Major Bollen .. ..	22	1	508	61	16	24·19
Pte. Clarke .. ..	17	2	204	71	13	13·6
" Hooper .. ..	22	1	276	44	16	13·14
" Brown .. ..	20	1	236	46	14	12·42
" Vivian .. ..	13	3	117	27	10	11·7
" Wells .. ..	7	1	50	16	5	8·33
" Thorn .. ..	17	2	119	17	14	7·93
" Clements .. ..	21	5	113	18	15	7·06
Lance-Corpl. Jessop .. ..	16	1	86	22	11	5·66
Pte. Smith .. ..	19	1	91	15	13	5·05
Qrmr.-Serjt. Beaumont .. ..	17	6	53	9	14	4·82

#### BOWLING AVERAGES.

Name	Overs	Maidens	Runs	Wickets	Average
Pte. Brown .. ..	173	26	731	80	9·14
" Hooper .. ..	47	2	235	24	9·79
Serjt.-Major Bollen .. ..	162	20	636	61	10·43
Pte. Clements .. ..	35	4	177	16	11·06

**NOTES FROM BLOEMFONTEIN.**—Lieutenant and Quartermaster H. Spackman, R.A.M.C., writes:—The first Annual Meeting of the Royal Army Medical Corps Rifle Club took place on May 6, at the School of Musketry Range, Tempe, with the following results: 200 yards—1, Private Grigg; 2, Private Cannon; 3, Captain Sampson. 500 yards—1, Private Grigg; 2, Private Cannon; 3, Private King. 600 yards—1, Private Grigg; 2, Captain Sampson; 3, Corporal Gross. Private Grigg was therefore the winner of the Challenge Cup and Silver Medal, making 75 out of a possible 105 points. Private Cannon came second with 66, and Captain Sampson third with 64 points. The result of the "May" Spoon Shoot at plates at 200 yards was as follows: 1, Private Cannon; 2, Serjeant Bell; 3, Private Gill.

It was a very fine day for shooting, light good but not strong, wind from light to calm, and from variable directions. There were twenty-two competitors, which included four officers. A tent was pitched just behind the firing point at 600 yards, and light refreshments were provided. The staff of the School of Musketry rendered every assistance, and a most enjoyable day was spent from a rifleman's point of view.

It was regretted that time did not permit of the competition amongst the staff of the School of Musketry for the spoon presented to them by the Royal Army Medical Corps Rifle Club. Quartermaster-Serjeant O'Kelly, on behalf of the School of Musketry, thanked the Royal Army Medical Corps for their gift, and said they would arrange for it to be shot for at an early date, and they would ask the Royal Army Medical Corps to witness the contest.

Serjeant Giles, Musketry Instructor of the Hants Regiment, who is going through a refresher course, then gave an exhibition of rapid magazine fire to repel an attack. He fired off 28 rounds in one minute, and on examination of the target it was found he had scored 27 hits, 7 of which were bull's-eyes.

At the conclusion of the day's proceedings, Major Forde kindly presented the prizes to the successful competitors.

I attach the rules and conditions of the competition which may be of interest to other Royal Army Medical Corps Rifle Clubs.

Our thanks are due to our energetic Secretary, Serjeant-Major S. J. How.

**ANNUAL MEETING OF THE ROYAL ARMY MEDICAL CORPS RIFLE CLUB, ON THE SCHOOL OF MUSKETRY RANGE, TEMPE, MAY 6, 1909. COMMENCING AT 1-15 P.M.**

**Committee.**—Lieutenant and Quartermaster Spackman, Serjeant-Major How, Quartermaster-Serjeant Renton, Serjeant Way, Serjeant Bell, Corporal Gross, Privates Cannon, King and Palmer, R.A.M.C.

**Events.**

- (1) *Pool Shooting* at 200 yards, Target 4 inches, invisible. Manager, Serjeant Way.
- (2) *Challenge Cup.*—Commence 1.30 p.m., 3rd Class Targets, shooting at 200 yards. One sighting shot, 7 to count. Recorders: Lieutenant Spackman and Private King. Prizes. For best scores at this distance, 1st, 7s. 6d.; 2nd, 5s.; 3rd, 2s. 6d.
- (3) *Pool Shooting* at 500 yards, target 6 inches, invisible bull's-eye. Manager: Serjeant Bell.
- (4) *Challenge Cup*, at 500 yards, targets 2nd Class, 1 sighting shot, 7 to count. Recorders: Serjeant-Major How and Serjeant Way. Prizes. For best scores at this distance, 1st, 7s. 6d.; 2nd, 5s.; 3rd, 2s. 6d.
- (5) *Pool Shooting* at 600 yards, target 8 inches, invisible bull's-eye. Manager: Staff-Serjeant Page.
- (6) *Challenge Cup*, shooting at 600 yards, targets 2nd Class, 1 sighting shot, 7 to count. Recorders: Quartermaster-Serjeant Renton, Corporal Gross. Prizes for the best scores at this distance: 1st, 7s. 6d.; 2nd, 5s.; 3rd, 2s. 6d. Prize for winner of Cup, Silver Medal.
- (7) *Shooting for the May Spoon*, 5 rounds in one minute, five iron plate targets to be placed opposite each firer. Distance 200 yards. Time keepers: Lieutenant Spackman and Serjeant-Major How. Recorders: Serjeant Bell and Private Palmer. Prizes. 1st, Silver Souvenir Spoon and 5s.; 2nd, 4s.; 3rd, 2s. 6d.
- (8) *Shooting for the Spoon presented by the Club for Competition by the Staff of the School of Musketry only.*

Rules and conditions for the above competitions are as published by the Committee. Prizes for the best aggregate on Challenge Cup and May Spoon Shoots: 1st, 10s. 2nd, 7s. 6d.; 3rd, 5s.

**Referee:** Quartermaster-Serjeant O'Kelley, School of Musketry.

STANLEY HOW, Serjeant-Major,  
Honorary Secretary.

**RULES AND CONDITIONS TO GOVERN SHOOTING ON MAY 6, 1909, AS PER  
PUBLISHED PROGRAMME.**

**Pool Shooting.**—All ammunition for the contests must be purchased from the manager in charge at each distance, price 3d. per round. The manager will pay 1d. per round to the club treasurer, and divide 2d. per round between the scorers of bull's-eyes. No shots will be marked except "bulls."

**Challenge Cup Shooting.**—Will commence at 200 yards range at 1.15 p.m. Competitors will be told off to fire by the recorders at each distance. All particulars will be found published under "General Rules" below.

**May Spoon Shoot.**—Rate, 5 rounds in one minute. No shot to be fired until the whistle sounds, no shot to count after the whistle sounds "Cease fire." Magazines may be loaded. Rifles to be at rest until whistle signals "Commence."

**General Rules.**—No "rests" or "aids" allowed except slings on rifles. Service rifles and sights only permitted. No handicapping. Penalty of enquiry 6d. on each occasion. Money credited to the club in the event of first report proving correct. Position of firer in each contest: Any military pool shooting may continue during prize competitions at the range being contested, but must terminate when the prize competition at that distance finishes. Matters of dispute respecting firing will be settled by the referee, and his decision will be final. Sights may be blackened or painted for all contests. Bisley marking, 5, 4, 3 and 2, will be adopted for the Cup Competition. Markers will be provided by School of Musketry on payment by the club. One sighting shot only allowed for the Challenge Cup Competition at each distance. No sighting shots allowed for the May Spoon. Records, hit or miss. The recorders may call on any of the committee to assist them in their duties. The senior recorder will be in charge of the firing at the range he is marking and his instructions must be obeyed, or referred to the referee in a regular manner. All shooting will be individual, and coaching or advice to any firer is forbidden. Unnecessary talking, or conduct prejudicial to those firing, is forbidden at the firing point. Anything not referred to above that may arise and requires adjustment will be settled by the Vice-President, Secretary and Treasurer of the Club, who will seek the advice of the Referee if necessary.

**CONDITIONS FOR SPOON SHOOT ON THURSDAY, MAY 6, 1909. TIME ABOUT 4.30 P.M.,  
OPEN TO THE STAFF OF SCHOOL OF MUSKETRY ONLY.**

**Practice 1.**—Eight figure 3 targets to be shown for each firer for ten seconds; fire as many rounds as you can in the time; targets are lowered for ten seconds, those hit not to appear again; two exposures, distance 200 yards; position, any military; each hit to count 3 points, rifle not to be brought to the aim until targets appear.

**Practice 2.**—Ten iron falling plates for each firer, rounds unlimited. Time one minute; position, any military; each hit to count 3 points; the plate must be knocked down to count a hit; rifle not to be brought to the aim until whistle sounds to commence.

**Practice 3.**—Rapid, 300 yards, target 4 feet by 4 feet (2nd Class); rounds 15. Rifle not to be loaded until whistle sounds to commence, loading to be 5 rounds at a time. Time, one minute. Hits: bull 4, inner 3, magpie 2, outer 1.

**Practice 4.**—Deliberate, 500 yards; target 6 feet by 6 feet (1st Class); 5 rounds (no sighters); all shots to be signalled; value of hits as in 3.

**NOTES FROM WYNBERG.**—Serjeant-Major C. W. Kinsella, 22 Company, R.A.M.C., writes: "Serjeant D. J. Bell and Serjeant-Major C. W. Kinsella have been awarded the Sanitary Inspector's certificate of the London Sanitary Institute.

"Majors W. E. Hardy and J. M. Buist went up for the May promotion examination, and Serjeant-Major Kinsella also sat for subhead 'd i,' Appendix XI., King's Regns.

"From May 1, the Wynberg Military Hospital has been reduced by a further fifteen beds, bringing the number down to sixty.

"Major J. G. McNaught, on return from leave, proceeds to Pretoria as Specialist Sanitary Officer."

**NOTES FROM SIMLA.**—Lieutenant-Colonel R. S. F. Henderson, R.A.M.C., Secretary to Principal Medical Officer, H.M.'s Forces in India (under date May 20, 1909), writes:—

**"Appointments.**—Colonel L. E. Anderson, British Service, has been appointed to officiate as Principal Medical Officer, 8th (Lucknow) Division, with effect from April 19, 1909. Colonel H. J. R. Moberly, British Service, has been appointed to officiate as Principal Medical Officer, Presidency and Assam Brigades, with effect from April 13, 1909.

**"The following officers are appointed to the Command of Station Hospitals named :** Lieutenant-Colonel F. P. Nichols, Jullundur; Lieutenant-Colonel H. J. Fletcher, Sialkot; Lieutenant-Colonel B. Skinner, Peshawar.

**"Major A. G. Thompson, R.A.M.C., is appointed in charge Brigade Laboratory at Ferozepore. Captain D. P. Johnstone, R.A.M.C., is appointed Officiating Sanitary Officer, Burma Division, vice Lieutenant-Colonel J. R. Forrest, R.A.M.C., vacated.**

**"Death.**—Captain C. D. M. Holbrook died at Station Hospital, Poona, from abdominal abscess, on May 6, 1909.

**"Leave.**—Surgeon-General P. M. Ellis, British Service, Principal Medical Officer, 8th (Lucknow) Division, has been granted six months' leave out of India on medical certificate. Colonel J. G. Harwood, British Service, Principal Medical Officer, Presidency and Assam Brigades, has been granted six months' leave out of India, on private affairs, with effect from March 16, 1909.

**"Relief.**—List of officers whose tour will expire during the coming trooping season by seniority, is attached.

**"NOMINAL ROLL OF ROYAL ARMY MEDICAL CORPS OFFICERS ON THE INDIAN ESTABLISHMENT WHO WILL BE TOUR-EXPIRED DURING THE TROOPING SEASON OF 1909-10.**

**"(Names entered in the Order of Seniority.)**

**"Lieutenant-Colonels F. P. Nichols, M.B.; F. J. Jencken, M.B., D.P.H.; W. W. Pike, D.S.O., F.R.C.S.I.; E. H. L. Lynden-Bell, M.B. (exchanging with Lieutenant-Colonel Simpson); J. R. Stuart, M.B. (will attain the age of retirement from the Service on March 17, 1910); G. Wilson, M.B.; W. C. Beavor, C.M.G., M.B.; S. F. Freyer, C.M.G., M.D. (proceeds home on retirement); J. R. Forrest; H. A. Haines, M.D.; G. E. Hale, V.H.S., D.S.O.; W. T. Swan, M.B.; C. T. Blackwell, M.D., D.P.H.; P. C. H. Gordon; H. D. Rowan, M.B.; H. Cocks, M.B.; F. W. G. Gordon-Hall, M.B.; A. Kennedy; H. P. C. Elkington, D.P.H.; H. M. Adamson, M.B.; A. R. Aldridge, M.B.; D. M. O'Callaghan; R. Holyoake; F. S. Le Quesne, V.C.; A. L. F. Bate. Majors E. A. Brunside; B. J. Inniss; R. C. Thacker; A. J. Luther; H. E. Winter; J. W. Jennings, D.S.O.; C. Dalton, V.H.S.; C. W. Duggan, M.B. (proceeds home on retirement); T. McDermott, M.B.; H. W. K. Read; J. B. Anderson; E. S. Clarke, M.B.; K. M. Cameron, M.B.; M. Boyle, M.B.; F. Kiddle, M.B.; J. Grech; St. J. B. Killery; G. T. K. Maurice; W. E. Hudleston; M. M. Rattray, M.B. Captains C. H. Hopkins; J. G. Berne, D.P.H.; G. B. Carter, M.B.; S. O. Hall; J. H. Brunskill, M.B., D.P.H.; A. J. Hull; A. B. Smallman, M.B. (service extended by one year to season of 1910-11); W. F. Ellis (service extended by one year to season of 1910-11); S. M. W. Meadows; T. E. Harty; B. G. Patch; D. P. Watson, M.B.; J. E. Powell (service extended by one year to season of 1910-11); F. M. M. Ommanney; R. H. MacNicol, M.B.; S. L. Pallant; C. R. Sylvester-Bradley; J. D. Richmond, M.B.; M. C. Wetherell, M.D.; H. C. Hildreth, F.R.C.S.E.; W. McD. MacDowall; R. T. Collins; T. J. Wright; A. C. Osburn; F. J. Turner; J. Fairbairn, M.B.; J. H. Douglass, M.D., D.P.H.; R. R. Lewis; A. L. Otway, M.B.; F. H. Noke, M.B., D.P.H.; W. F. H. Vaughan; R. B. Hole; T. C. Lucas, M.B., D.P.H. (Surgeon to H.E. the Governor of Bombay, service extended by one year to season of 1910-11); G. E. Cathcart; W. Wiley, M.B.; H. Harding, M.B.; J. A. Turnbull; M. F. Grant; M. D. Ahern; F. J. Garland, M.B.; A. A. Meaden (service extended by one year to season of 1910-11); S. C. Bowle (service extended by one year to season of 1910-11); A. S. Arthur, M.B.**

**"Specialists.**—The following officer is appointed specialist in the subject named, with effect from the date of his assuming duties: (b) *Dermatology*, Lieutenant A. Dawson, 9th (Secunderabad) Division."

#### **MILITIA.**

Captain William Fletcher, D.S.O., M.B., resigns his commission, dated September 20, 1908.

#### **TERRITORIAL FORCE.**

##### **YEOMANRY.**

*Berks (Hungerford).*—Surgeon-Lieutenant Maurice W. Coleman, M.D., resigns his commission, dated April 30, 1909.

## ROYAL FIELD ARTILLERY.

*2nd South Midland Brigade.*—Surgeon-Captain George H. Rutter, M.B., resigns his commission, dated March 31, 1909.

## INFANTRY.

*5th (Earl of Chester's) Battalion, The Cheshire Regiment.*—Surgeon-Major and Honorary Surgeon-Lieutenant-Colonel Theodore Fennell resigns his commission, with permission to retain his rank, and to wear the prescribed uniform, dated April 30, 1909.  
*15th (County of London) Battalion, The London Regiment (Prince of Wales's Own, Civil Service Rifles).*—Supernumerary Surgeon-Lieutenant Robert W. Branthwaite to be Surgeon-Captain, and is absorbed into the establishment, dated May 1, 1909.

## ROYAL ARMY MEDICAL CORPS.

*1st Lowland Field Ambulance.*—Quartermaster and Honorary Captain James Kenny is granted the honorary rank of Major, dated April 30, 1909.

*1st Eastern General Hospital.*—Lieutenant-Colonel Joseph Griffiths, M.D., to be Colonel, dated May 6, 1908.

*4th London General Hospital.*—Quartermaster and Honorary Lieutenant James Boxall is granted the honorary rank of Captain, dated May 20, 1909.

*Attached to Units other than Medical Units.*

Lieutenant-Colonel and Honorary Surgeon-Colonel James K. Anderson, M.D., relinquishes his commission, under the conditions of paragraph 59, Territorial Force Regulations, and is granted permission to retain his rank, and to wear the prescribed uniform, dated March 3, 1909.

Owen John Parry-Edwards, M.B., to be Lieutenant, dated April 15, 1909.

Lieutenant-Colonel Arthur D. Webster, M.D., resigns his commission, and is granted permission to retain his rank, and to wear the prescribed uniform, dated April 29, 1909.

Surgeon-Captain James Herbert Dixon, from the Welsh Divisional Engineers, to be Captain, dated May 6, 1908.

## ROYAL ARMY MEDICAL CORPS.

*1st South Midland Field Ambulance.*—Quartermaster and Honorary Lieutenant William Harold Kimpton, from the 2nd South Midland Field Ambulance, to be Quartermaster, with the honorary rank of Lieutenant, dated May 7, 1909.

*1st London (City of London) General Hospital.*—To be Captains, whose services will be available on mobilization :—

Frederick William Andrewes, M.D., dated May 25, 1909.

Walter Langdon Brown, M.D., dated May 25, 1909.

*2nd London Sanitary Company.*—John Muir, M.B., to be Lieutenant, dated May 5, 1909.

*For attachment to Units other than Medical Units.*

Lieutenant John Paton, M.D., to be Captain, dated February 16, 1909.

The promotion to a majority of Captain Edmond U. F. MacW. Bourke bears date September 28, 1908, and not March 1, 1909, as stated in the *London Gazette* of April 6, 1909.

Captain Frank Grégoire Proudfoot, M.D., from the 3rd Southern General Hospital, to be Captain, dated May 1, 1909.

David Gerald Kennard to be Lieutenant, dated May 17, 1909.

## ROYAL ARMY MEDICAL CORPS.

*1st Home Counties Field Ambulance.*—Captain William J. Woodman resigns his commission, dated February 11, 1909.

*2nd London (City of London) Field Ambulance.*—Haldinstein David Davis to be Lieutenant, dated April 16, 1909.

*4th London Field Ambulance.*—William Cowie, M.B., to be Lieutenant, dated April 7, 1909.

*2nd Northumbrian Field Ambulance.*—Edward Lyall to be Quartermaster, with the honorary rank of Lieutenant, dated April 1, 1909.

*3rd London General Hospital.*—Herbert Ernest Balfern Ware to be Quartermaster, with the honorary rank of Lieutenant, dated April 1, 1909.

*3rd Western General Hospital.*—Surgeon-Lieutenant-Colonel and Honorary Surgeon-Colonel David Hepburn, M.D., from the 2nd Volunteer Battalion, the Welsh Regiment,

to be Lieutenant-Colonel, with the honorary rank of Surgeon-Colonel, with precedence as in the Volunteer Force, dated April 1, 1908.

Ewen John Maclean, M.D., to be Major, dated March 11, 1909.

George Dominic Purnell to be Quartermaster, with the honorary rank of Lieutenant, dated March 15, 1909.

*For attachment to Units other than Medical Units.*

Surgeon-Lieutenant-Colonel and Honorary Surgeon Colonel Edward Morton Garstang, M.D., from the 2nd Volunteer Battalion, the Loyal North Lancashire Regiment, to be Lieutenant-Colonel, with the honorary rank of Surgeon-Colonel with precedence as in the Volunteer Force, dated April 1, 1908.

Supernumerary Captain Frederick Lace, from the 4th Battalion, the Prince Albert's (Somersetshire Light Infantry), to be Major, dated March 1, 1909.

James McGlashan, M.D., to be Lieutenant, dated March 31, 1909.

Frederick William Higgs, M.B., to be Lieutenant, dated April 1, 1909.

James Alexander Raeburn, M.B., to be Lieutenant, dated April 13, 1909.

Robert Vernon Giraud Monckton, M.D., to be Lieutenant, dated April 16, 1909.

*Attached to Units other than Medical Units.*

Major John F. Tabb to be Lieutenant-Colonel, dated April 4, 1908.

Captain Herman Stedman, M.D., to be Major, dated November 23, 1908.

ROYAL ARMY MEDICAL CORPS.

*1st South Western Mounted Brigade Field Ambulance.*—William Howard Romyn Alexander to be Transport Officer with the honorary rank of Lieutenant, dated March 18, 1909.

*3rd South Midland Field Ambulance.*—Lieutenant Bertram M. H. Rogers, M.D., to be Captain, dated April 8, 1909.

*London Mounted Brigade Field Ambulance.*—Hugh Stanley Beadles to be Lieutenant, dated March 5, 1909.

*1st South Midland Mounted Brigade Field Ambulance.*—John Milne Dalrymple, M.B., to be Lieutenant, dated April 6, 1909.

*2nd London Sanitary Company.*—Lieutenant Walter F. Corfield to be Captain, dated March 30, 1909.

Peter Caldwell Smith, M.D., to be Captain, dated March 30, 1909.

*For attachment to Units other than Medical Units.*

Surgeon-Captain Edward Gray, from the 2nd Cheshire (Railway) Royal Engineers (Volunteers), to be Captain, with precedence as in the Volunteer Force, dated April 1, 1908.

William James Hoyten to be Lieutenant, dated April 21, 1909.

ROYAL ARMY MEDICAL CORPS.

*1st London (City of London) Field Ambulance.*—Lieutenant Andrew Elliot, M.D., from the 2nd London (City of London) Field Ambulance, to be Lieutenant, dated March 4, 1909.

*3rd South Midland Field Ambulance.*—Charles Corfield to be Lieutenant, dated March 18, 1909.

Alfred Coleridge, M.B., to be Lieutenant, dated March 23, 1909.

*1st Welsh Field Ambulance.*—Lieutenant Thomas Donovan to be Captain, dated December 12, 1908.

*1st London (City of London) General Hospital.*—Officers whose services will be available on mobilization :—

Captain James Calvert, M.D., to be Major, dated February 20, 1909.

Captain William McAdam Eccles, M.B., F.R.C.S.Eng., to be Major, dated March 13, 1909.

*1st Northern General Hospital.*—The undermentioned to be officers whose services will be available on mobilisation, dated March 30, 1909 :—

To be Lieutenant-Colonels: David Drummond, M.D.; Sir Thomas Oliver, Kt., M.D.; George Walter Ridley, M.B., F.R.C.S.Eng.; Albert Morton Martin, M.B.

To be Majors: Henry Brunton Angus, M.B., F.R.C.S.Eng.; Thomas Beattie, M.D.; William Errington Hume, M.B.; William George Richardson, M.B., F.R.C.S.Eng.; William Drewett Arnison, M.D.; John Dobson Wardale, M.B.; Robert Patton Ranken Lyle, M.D.

To be Captains:—Joseph William Leech, M.D., F.R.C.S.Edin.; George Grey Turner, M.B., F.R.C.S.Eng.; Horsley Drummond, M.B.; Alfred Parkin, M.D., F.R.C.S.Eng.; George Hall, M.D.; Thomas Moffatt Allison, M.D.; Joseph Collingwood Stewart, M.B.; William Edward Moore Ede, M.D.; Samuel Short Whillis, M.D.; Daniel Wells Patterson, M.B.; Thomas Gowans, M.B.; Herbert James Slade, M.B.; Henry Herbert Markham, M.B.; William John Phillips, M.B.; William Seymour, M.B.

*For attachment to Units other than Medical Units.*

Frank John Hathaway, M.D. (late Lieutenant United Services College Cadet Corps), to be Lieutenant, with precedence as from April 8, 1907, dated July 15, 1908.

#### ROYAL ARMY MEDICAL CORPS.

*South Wales Mounted Brigade Field Ambulance.*—Captain John R. I. Raywood to be Major, dated February 25, 1909.

*2nd Home Counties Field Ambulance.*—George Thomas Willan to be Lieutenant, dated April 3, 1909.

*2nd Welsh Field Ambulance.*—James Nicholas to be Quartermaster, with the honorary rank of Lieutenant, dated April 29, 1909.

*2nd Wessex Field Ambulance.*—Thomas Phare Puddicombe to be Lieutenant, dated April 27, 1909.

*2nd London Sanitary Company.*—Arthur John Martin to be Lieutenant, dated April 26, 1909.

*For attachment to Units other than Medical Units.*

Surgeon-Lieutenant-Colonel and Honorary Surgeon-Colonel David Lennox, M.D., from the 1st (City of Dundee) Volunteer Battalion, the Black Watch (Royal Highlanders), to be Lieutenant-Colonel, with the honorary rank of Surgeon-Colonel, with precedence as in the Volunteer Force, dated April 1, 1908.

Surgeon-Lieutenant-Colonel and Honorary Surgeon-Colonel Robert Ross Brown, from the 1st Kent Royal Garrison Artillery (Volunteers), to be Lieutenant-Colonel, with the honorary rank of Surgeon-Colonel, with precedence as in the Volunteer Force, dated April 1, 1909.

Surgeon-Lieutenant-Colonel and Honorary Surgeon-Colonel Henry Colgate, M.D., from the 2nd Sussex Royal Garrison Artillery (Volunteers), to be Lieutenant-Colonel, with the honorary rank of Surgeon-Colonel, with precedence as in the Volunteer Force, dated April 1, 1908.

Supernumerary Surgeon-Lieutenant-Colonel and Honorary Surgeon-Colonel William Dakin Waterhouse, from the 4th Volunteer Battalion, the Royal Fusiliers (City of London Regiment), to be Lieutenant-Colonel, with the honorary rank of Surgeon-Colonel, with precedence as in the Volunteer Force, dated April 1, 1908.

Surgeon-Lieutenant-Colonel and Honorary Surgeon-Colonel James Bruce Ronaldson, from the 7th Volunteer Battalion, the Royal Scots (Lothian Regiment), to be Lieutenant-Colonel, with the honorary rank of Surgeon-Colonel, with precedence as in the Volunteer Force, dated April 1, 1908.

Surgeon-Captain Arthur Conning Hartley, M.D., from the 1st Bedfordshire Royal Engineers (Volunteers), to be Captain, with precedence as in the Volunteer Force, dated April 1, 1908.

Surgeon-Captain George Harvey Goldsmith, M.D., from the 1st Bedfordshire Royal Engineers (Volunteers), to be Captain, with precedence as in the Volunteer Force, dated April 1, 1908.

Captain Richard Emmett to be Major, dated October 23, 1908.

Captain Alan Y. Greenwood, M.B., resigns his commission, dated March 22, 1909.

#### VOLUNTEER CORPS.

##### ROYAL GARRISON ARTILLERY (VOLUNTEERS).

*5th Lancashire.*—Surgeon-Captain Thomas W. Butcher, M.B., resigns his commission, dated March 31, 1908.

##### INFANTRY.

*2nd Volunteer Battalion, The King's (Liverpool Regiment).*—Surgeon-Lieutenant William H. Broad, M.D., resigns his commission, dated March 31, 1908.

#### ROYAL ARMY MEDICAL CORPS.

*London District, London Companies.*—Lieutenant Allan C. Parsons resigns his commission, dated March 31, 1908.



### NOTES FROM WEST LANCASHIRE DIVISION, ROYAL ARMY MEDICAL CORPS.

Captain J. H. P. Graham writes: "It augurs well for the future that the flow of recruits has, so far, not been characterised by overwhelming, but evanescent periods; there is then no reason to fear the time when igneous methods of recruitment, recently in vogue, shall have died down. Now that men are interested it remains to provide materials and secure the interest perpetually. Externals go for a good deal; for this reason headquarters should be such as befit honourable service, giving room for the social as well as the 'shop' side of it, and, from both points of view, waken pride and interest in those whose privilege it is to use them.

"The inception of the Field Ambulance, with the experimental air about it, has, perhaps, led to a diminished interest in the evolution of the first line of assistance generally. Yet every part of the organisation, constituting the 'zone of collection,' has undergone metamorphosis. It is not merely that the Bearer Company and Field Hospital have been merged; but it cannot be denied that misconception exists on these points. While the re-organisation the field medical units of the division have undergone scarcely alters their rôle fundamentally, or their sphere of action, yet, owing largely to advances in military hygiene, the *personnel* and responsibilities in the 'first line' have been materially added to. The institution of the Field Ambulance does not signal the abolition of the first line of assistance, nor render it supererogatory; the first line remains an integral and essential part of a scientific organisation, the parts of which are interdependent, though in some degree interchangeable. It will be unfortunate if misconceptions on these points become established, for there are difficulties in combating heresies at large. The work in the first line has an interest all its own, and here it is that the organisations for sanitation and for dealing with sick and wounded in war join up. Mistakes made here, in either connection, may often be difficult to eradicate by the agencies lower down the lines. In peace the perennial needs of many regimental units, remote from headquarters of medical units, can only be met by a medical staff on the spot. If the question of providing means for adding to the *personnel*, and forming rest and collecting posts, in the 'collecting zone' is considered, the first line must be regarded as a dominant and essential nucleus, round which auxiliary aid can be centred, and by which it must, to a large extent, be ordered during operations. The problems connected with camp sanitation, or, rather, unit sanitation, are of paramount importance, as is also the teaching of personal hygiene. In these things the first line stands as a barrier against a potential tide of infection. The work to be accomplished by officers in medical charge of regimental units, under any conditions, is not to be measured by that they perform during annual training at selected camps, and during the non-training period at regimental headquarters. Annual training really affords an occasion for knowing what is aimed at accomplishing in war, and thinking over the methods of hasty improvisation that must be substituted for leisurely prearrangement."

### NOTES FROM THE 1st NORTHERN GENERAL HOSPITAL, ROYAL ARMY MEDICAL CORPS (T.).

The 1st Northern General Hospital Company of the Royal Army Medical Corps Territorials are at present undergoing their period of annual training at the Military Hospital, York, under the direction of Serjeant-Major Nelson. The men are enjoying excellent health, and have entered into the experience of barrack-room life with cheerful good nature.

Under the guidance of the matron and sisters of the Queen Alexandra Imperial Military Nursing Service in the wards, they are becoming trained in hospital work, and are taking up their duties with enthusiasm.

Lieutenant-Colonel Turner, R.A.M.C., commanding, is taking great interest in the instruction of the Company, and they have met with the utmost *bonhomie* from the regular N.C.O.'s and men of the Royal Army Medical Corps, as well as of other regiments.

The Company was inspected on Wednesday, June 16, by Colonel Babbie, V.C., C.M.G., M.B., Inspector of Medical Services, who expressed himself highly pleased with the appearance of the men and with the duties in which they were being instructed.

### QUEEN ALEXANDRA'S IMPERIAL MILITARY NURSING SERVICE.

The following ladies have received appointments as Staff Nurse: Miss W. E. Eardley, Miss M. Clayden.

*Postings and Transfers.*—Matrons: Miss A. S. Bond, R.R.C., to Military Hospital, Colchester, from Military Hospital, Devonport; Miss E. A. Dowse, R.R.C., to Military Hospital, Cottonera, Malta, from Military Hospital, Valletta; Miss M. Wilson, to Military Hospital, Cork, on return from Malta. Sisters: Miss E. M. Pettie, to Royal Victoria Hospital, Netley, on return from Egypt; Miss A. MacCormac, to Military Hospital, Cottonera, Malta, from Military Hospital, Valletta; Miss L. M. Moor, to Military Hospital, Potchefstroom, South Africa, from Military Hospital, Bloemfontein; Miss E. S. Mason, to Military Hospital, Pretoria, from Military Hospital, Bloemfontein; Miss E. M. Fairchild, to Military Hospital, Wynberg, from Military Hospital, Bloemfontein; Miss E. M. Denne, to Military Hospital, Bloemfontein, from Military Hospital, Harrismith; Miss M. Walker, to Military Hospital, Bloemfontein, from Military Hospital, Pietermaritzburg; Miss J. Murphy, to Military Hospital, Edinburgh, from Royal Infirmary, Dublin. Staff Nurses: Miss W. E. Eardley and Miss K. M. Burgess, to the Queen Alexandra Military Hospital, Millbank, London, on appointment; Miss M. M. A. McCreery, to Military Hospital, Pretoria, on arrival in South Africa; Miss G. A. Howe, to Military Hospital, Potchefstroom, on arrival in South Africa; Miss J. S. G. Gardner, to Military Hospital, Potchefstroom, on arrival in South Africa; Miss M. C. Johnston, to Military Hospital, Bloemfontein, on arrival in South Africa; Miss C. W. Jones, to Military Hospital, Bloemfontein, on arrival in South Africa; Miss J. G. Dalton, to Military Hospital, Bloemfontein, on arrival in South Africa; Miss M. D. Woodhouse, to Military Hospital, Bloemfontein, on arrival in South Africa; Miss A. E. M. Steen, to Military Hospital, Colchester, from Cambridge Hospital, Aldershot; Miss C. H. Hodson, to Cambridge Hospital, Aldershot, from the Queen Alexandra Military Hospital, Millbank, London; Miss M. German, to Military Hospital, Cairo, on arrival in Egypt; Miss W. Halloran, to the Queen Alexandra Military Hospital, Millbank, London, on appointment; Miss J. A. M. Stuart, to Convalescent Hospital, Aldershot, on appointment.

*Appointments Confirmed.*—Staff Nurse: Miss L. E. Schneider.

*Arrivals.*—Miss E. A. Wilkinson, Matron, from South Africa; Miss M. Wilson, Matron, from Malta.

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### RESULTS OF EXAMINATIONS, LIEUTENANTS, R.A.M.C.

THE following results of examinations are notified for general information:—

Passed in (h) i for rank of Captain: C. R. M. Morris, M.B.; H. P. Hart, M.B.; R. H. S. Grigg, M.B.; A. S. Littlejohns; J. A. Renshaw; J. H. Spencer, M.B.; G. F. Dawson, M.B.; W. J. E. Bell, M.B.; H. M. J. Perry; M. F. Grant, M.B.; C. P. O'Brien-Butler.

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### UNITED SERVICES MEDICAL SOCIETY.

THERE will be no meeting of the above named Society in July. The next meeting will take place at the R.A.M. College, Millbank, S.W., on Wednesday, October 13, 1909, at 8.30.

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### ROYAL ARMY MEDICAL CORPS ANNUAL DINNER, 1909.

THE Annual Dinner was held in the Empire Rooms at the Trocadero Restaurant, at 8 p.m., on June 14, the Director-General in the Chair. Mr. Vesey Holt was the only guest. Dinner was served for 233. The following officers were present:—

*Surgeon-Generals.*—Sir Alfred Keogh, K.C.B., K.H.P., Director-General, A.M.S., in the Chair. G. D. Bourke, C.B., K.H.P., W. F. Burnett, Sir C. McD. Cuffe,

K.C.B., W. Donovan, C.B., J. C. Dorman, C.M.G., J. Dallas Edge, C.B., P. M. Ellis, G. J. H. Evatt, C.B., W. L. Gubbins, C.B., M.V.O., H. Skey Muir, C.B., W. S. M. Price, R. H. Quill, Sir Wm. Taylor, K.C.P., K.H.P., H. P. Whitehead.

*Surgeon-Major-General*.—A. F. Bradshaw, C.B., K.H.P.

*Deputy Surgeon-General*, W. G. Don.

*Colonels*.—W. Babbie, V.C., C.M.G., J. M. Beamish, W. L. Chester, Sir J. R. A. Clarke, Bart., C.B., T. M. Corker, A. E. J. Croly, J. R. Dodd, R. W. Ford, D.S.O., G. T. Goggin, C. E. Harrison, K.H.S., J. C. Harwood, H. C. Hathaway, F. Hensman, C.M.G., R. Jennings, W. Johnston, C.B., T. F. MacNeece, J. Magill, C.B., J. Maturin, W. Allan May, C.B., A. P. O'Connor, C.B., S. K. Ray, W. F. Stevenson, C.B., K.H.S., D. Wardrop, T. P. Woodhouse.

*Surgeon-Colonel* W. T. Martin.

*Brigade-Surgeon-Lieutenant-Colonels*.—J. F. Beattie, W. J. Wilson.

*Surgeon-Lieutenant-Colonel* C. R. Kilkelly, C.M.G., M.V.O.

*Lieutenant-Colonels*.—G. G. Adams, S. G. Allen, T. Archer, J. Battersby, R. P. Bond, U. J. Bourke, F. H. M. Burton, C. H. Burtchaeil, H. Carr, A. Clarke, T. H. F. Clarkson, H. E. Cree, J. S. Davidson, A. M. Davies, W. Dick, A. Dodd, W. S. Dowman, S. E. Duncan, E. Eckersley, N. C. Ferguson, C.M.G., R. H. Firth, S. F. Freyer, C.M.G., R. I. D. Hackett, T. W. O'H. Hamilton, C.M.G., R. G. Hanley, F. W. H. Davie Harris, A. P. Hart, L. Haywood, M. L. Hearn, S. Hickson, G. D. Hunter, D.S.O., J. M. Irwin, C. W. Johnson, F. W. C. Jones, C. L. Josling, R. Kirkpatrick, C.M.G., W. B. Leishman, T. J. R. Lucas, C.B., W. G. Macpherson, C.M.G., A. A. Macrobin, J. Meek, C. H. Melville, R. E. R. Morse, C. E. Nichol, D.S.O., D. V. O'Connell, M' O'Halloran, R. H. Penton, D.S.O., W. Hooper Pinches, W. L. Reade, J. D. T. Reckitt, E. J. Erskine Risk, Sir J. Rogers, K.C.M.G., D.S.O., M. W. Russell, J. V. Salvage, R. H. S. Sawyer, H. Scott, R. J. S. Simpson, C.M.G., H. M. Sloggett, C. S. Sparkes, A. A. Sutton, D.S.O., J. Tidbury, F. H. Treherne, G. T. Trewman, C. R. Tyrrell, E. O. Wight, E. M. Wilson, C.B., C.M.G., D.S.O., J. B. Wilson, R. W. Wright.

*Majors*.—R. F. E. Austin, K. B. Barnett, T. B. Beach, F. W. Begbie, W. W. O. Beveridge, D.S.O., W. G. Beyts, E. T. F. Birrell, A. P. Blenkinsop, H. A. Bray, H. J. M. Buist, D.S.O., E. W. W. Cochrane, C. W. Duggan, P. Evans, F. Faichnie, S. H. Fairrie, C. C. Fleming, D.S.O., C. M. Fleury, J. V. Forrest, H. C. French, W. L. Gray, S. F. Green, W. Hallaran, W. S. Harrison, E. C. Hayes, A. W. Hooper, D.S.O., W. H. Horrocks, T. P. Jones, B. W. Longhurst, C. B. Martin, A. E. Milner, L. A. Mitchell, G. A. Moore, S. Guise Moores, H. L. W. Norrington, J. Paterson, J. Poe, F. J. W. Porter, D.S.O., C. W. Profeit, J. Ritchie, J. H. Rivers, O. L. Robinson, L. R. Smith, C. G. Spencer, G. B. Stairstreet, H. S. Thurston, W. Tibbits, C. F. Wanhill, W. A. Ward, B. F. Zimmerman.

*Captains*.—R. B. Ainsworth, F. Ashe, H. P. Barrow, W. H. Bean, R. H. Bridges, H. Browne-Mason, W. Byam, H. St. M. Carter, J. G. Churton, J. T. Clapham, J. Cowan, C. C. Cumming, W. Davis, P. G. Easton, E. E. Ellery, H. Ensor, D.S.O., C. R. Evans, F. G. Fitzgerald, C. E. Fleming, J. G. Foster, A. T. Frost, C. H. Furnivall, W. R. P. Goodwin, A. R. Greenwood, L. W. Harrison, F. Harvey, G. S. C. Hayes, P. H. Henderson, G. J. Houghton, R. N. Hunt, D. O. Hyde, A. D. Jameson, J. C. Kennedy, E. Blake Knox, J. W. Langstaff, E. H. Lloyd, H. W. Long, J. F. Martin, J. McCarthy, E. McDonnell, D. O'Connor, F. M. Parry, H. G. Pinches, T. J. Potter, K. H. Read, H. Rogers, F. E. Rowan Robinson, E. Ryan, H. F. Shea, J. B. Short, H. Simson, C. S. Smith, S. B. Smith, W. M. H. Spiller, F. A. Stephens, C. H. Straton, J. Tobin, N. D. Walker, A. L. Webb, W. A. Woodside, A. O. B. Wroughton.

*Lieutenants*.—H. P. Hart, F. W. Hewson, W. E. Marshall, W. P. O'Farrell, C. H. O'Rorke, S. McK. Saunders, R. E. Todd.

*Guest*.—Vesey Holt, Esq.

During dinner the following programme of music was performed by selected musicians from the Corps Band, under the direction of Mr. G. P. Robertson, Bandmaster, R.A.M.C.

#### PROGRAMME OF MUSIC.

(1) <i>March</i>	..	..	..	"Soldaten Leben"	..	..	..	<i>Schmeling.</i>
(2) <i>Gavotte</i>	..	..	..	.. "Mimosa"	..	..	..	<i>Aletter.</i>
(3) <i>Selection</i>	..	..	..	"Tom Jones"	..	..	..	<i>German.</i>
(4) <i>Valse</i>	..	..	..	"Songe d'Automne"	..	..	..	<i>Joyce.</i>
(5) <i>Menuet</i>	..	..	..	.. ..	..	..	..	<i>Boccherini.</i>

- |  |                                |       |       |       |       |            |
|--|--------------------------------|-------|-------|-------|-------|------------|
| (6) <i>Wolfram's Song</i> .. ..          | "O Star of Eve" .. ..          | .. .. | .. .. | .. .. | .. .. | Wagner.    |
| (7) <i>Selection</i> .. ..               | "H.M.S. Pinafore" .. ..        | .. .. | .. .. | .. .. | .. .. | Sullivan.  |
| (8) <i>Valse</i> .. ..                   | "Ciribiribin" .. ..            | .. .. | .. .. | .. .. | .. .. | Bucalossi. |
| (9) <i>Intermezzo</i> .. ..              | "Cavalleria Rusticana" .. ..   | .. .. | .. .. | .. .. | .. .. | Mascagni.  |
| (10) <i>From the Ballet "Coppelia"</i> { | (a) "Majurka" .. ..            | .. .. | .. .. | .. .. | .. .. | Délibes.   |
|  | (b) "Valse de la Poupée" .. .. | .. .. | .. .. | .. .. | .. .. |            |
|  | (c) "Czardas" .. ..            | .. .. | .. .. | .. .. | .. .. |            |
- "GOD SAVE THE KING."

At the conclusion of dinner, after the usual loyal toasts had been honoured, Surgeon-General Sir William Taylor, K.C.B., proposed the health of the Director-General and said:—

"Sir Alfred Keogh, you are asked to forgive this evening a breach of the unwritten Corps Orders. Unwritten orders—old and respected customs—we know should have as ready obedience as those promulgated in the Order Book, but, Sir, you will admit that there are occasions when orders, if not actually disobeyed in the spirit of opposition, may be disregarded. There have been instances in which men have risen to high place, distinction, and honour through disobedience of orders. No result of that kind is looked for in this one, it is only hoped that you will overlook the offence.

"Gentlemen, it is certain that no disapproval of this departure from custom, however wise and respected, will come from you when you know the reason for it. The necessity for this departure from rule is one which we all deeply regret, but we would not lose the opportunity of expressing our feelings with regard to it. That will not take long or require many words, for 'Good wine needs no bush,' and the gist of what might be extended to great length can be conveyed to you in five words:—

"*Diri omnia, quum hominem nominavi.*"

"Gentlemen, you all know, and I am sure deeply regret, that this is the last Annual Corps Dinner at which Sir Alfred Keogh will preside as Director-General, though we all hope, of course, to see him at our annual gatherings for many years to come.

"He is retiring, not like most of his predecessors, in the fading, or perhaps more correctly, faded years of life, but in the full vigour of his prime. Those who know something of the cares, anxieties and worries of Office, and especially of the Director-General's Office, will, however, understand and appreciate his desire for rest and quiet.

"Sir Alfred Keogh became responsible for the navigation of the Military Medical Service Ship when careful, capable handling, and skilful seamanship were required. There were breakers ahead, and shoals and quicksands on every quarter. It needed a self-reliant and competent pilot to steer her through the troubled waters. A clear, cool head and sound judgment were necessary to circumvent the half hidden dangers of an Advisory Board Scilla without running into and being overcome by the ever circling currents of the Charybdis of military and official jealousy or suspicion. And if by expertness she was steered safely past these dangers, the pilot had to close his ears to the seductive strains of the Sirens of the Nursing Board. These were real dangers, gentlemen, and every man in the Corps must feel grateful to Sir Alfred for the dexterous and clever way in which he escaped from them. But the Army generally, as well as our own Service, owe to him many measures for betterment during his five years of office. The following eight stand out as of first importance:—

"The Army Order of February, 1907, which places sanitation in an important position and makes it a compulsory subject for promotion examination for all officers in the Army. What an advance this is, we, who know the amount of knowledge of sanitation formerly possessed by regimental officers, can well realise!

Millbank Hospital is now a part of the College, and the association of these two institutions, in spite of the dangers which were apprehended, has been altogether to the advantage of the Service.

"The College has been recognised by London University as one of its teaching centres. That fact speaks as well for the perspicacity of the University as it does for the reputation of the College teaching.

"Consulting physicians and surgeons from among eminent civilian members of the profession have been appointed to Queen Alexandra Military Hospital, Millbank. Not as necessities, but in order that the best, from the civil and military medical professions, may meet.

"The Royal Warrant of January, 1907, which made an establishment of Lieutenant-Colonels, and increased the pay of Colonels. Whatever the personal feelings of some of you may be about the former, the latter it is certain met with your cordial approval.

"The appointment of Medical Inspectors of recruits in each Command. The importance of this to the army it is impossible to overestimate; gone are those opportunities for the dodges of the recruiting serjeant.

"The creation of the Territorial Medical Service which has now a complete war organisation, and has a strength of over 80 per cent. of its establishment. In the medical units themselves the percentage of strength to establishment is much higher, and is greater than is to be found in any other branch of the Territorial Force, and rumour has it that there are grave apprehensions that the Territorial Force will be entirely medical. That there are grounds for these apprehensions you will see from the eighth measure, which is:—

"The Territorial Nursing Service, which provides a complete *personnel*—these words are official, not mine—for the general hospitals of the Territorial Force."

"Seriously, gentlemen, these are achievements which mean advance—improvement—gain to the whole army, and of which the Director-General has every reason to be proud. But there are many others due to his untiring energy and clear-sighted policy, and among them the present efficient condition of the Royal Army Medical College is one which stands out in dignified prominence. No one who has seen the splendid laboratories and other means for the pursuit of scientific research can but be lost in admiration of the perfect organisation of which they are the outcome. No one who knows the personal staff of the College can doubt for a moment that the teaching is the very best, and equal to that of any college in the world. Not an officer of the Corps who has passed through the College course can have the slightest fear that the Royal Army Medical Corps will be left behind in biological research while there is a 'Leishman' on the staff of the College.

"Every one of that staff is stimulated by the same desire that the Corps shall be pre-eminent in all research work.

"Sir Alfred has made it the great object of his official life that an Officer of the Medical Service should deserve to be looked up to as a man of the highest professional and scientific attainments, and to take care that, being so, he should be appraised at his proper value, not under it.

"By his tact and energy, as well as by his firm belief in his own service, he has upheld the position of the Director-General in the councils of the army, and there is no doubt whatever that his retirement will be felt to be a loss to the whole army, and will be regretted by all with whom he has had official dealings, from the Secretary of State downwards.

"Gentlemen, it is because of these facts, because of his unselfish devotion to the Medical Service as a whole, and of his personal interest in every officer belonging to it who has its reputation at heart, it is because of the strength of purpose, and yet courteous, pleasant way in which he has striven to maintain the dignity of our profession and service, that his retirement will be regretted universally, and especially by those of the Service for which he has laboured so diligently and for which he has done so much. For these reasons, too, the good wishes of every officer of the Army Medical Service and of the Royal Army Medical Corps will go with him into his retirement, where we all hope he will find leisure for those literary pursuits he so greatly delights in. Our wishes, and hopes, too, are that he will live for many years in the enjoyment of the knowledge that while he was in office he was looked up to with esteem and respect, and it is to assure him that the esteem and regard which he won as Director-General go with him into his retirement, that I ask you, brother officers, to respond to this toast in a manner which will leave no doubt of the truth of these remarks.

"Gentlemen, 'Sir Alfred Keogh, long life and continued happiness to him.'"

The toast was received with acclamation, and drunk with musical honours.

The DIRECTOR-GENERAL, who on rising was greeted with great enthusiasm, replied:—

"BROTHER OFFICERS AND GENTLEMEN,—I feel deeply the very warm reception which has been given to the toast, so kindly and so eloquently proposed by my late chief, Sir William Taylor. I should like to point out at the very beginning that in speaking in terms so flattering, Sir William Taylor has been, unknown to himself, really praising the work of his own Directorate. As a matter of fact, the period during which I have been responsible for the government of the medical branch of the army, has been a singularly quiescent one. I have done no more than carry out the policy initiated by him during the stormy and difficult period with which he had to contend. I might limit myself now to the endeavour to find words to express to you how grateful I am to the Corps for the support which it has given to me throughout the period of my heavy responsibilities, culminating to-night in this magnificent enthusiasm.

Gentlemen, I wish I could express to you fully all that I feel. I only make one claim upon your remembrance, and that is, that during my time I have given myself heart and soul to the endeavour to guard your efficiency, your honour, and your interests. I have but attempted to continue the policy, the fundamental principles of which were established by McGrigor one hundred years ago, by Muir subsequently—principles which were taught to me by Sanford Moore, Slaughter, Walsh, and others, under whose influence I came very early in my career. I will not attempt to retrospect, because there is so much to be said that I could not adequately deal with any one of the thoughts which come crowding in upon me as I stand before you. I will only say, and this is an eloquent fact, that during the period of our respective directorates, those of Sir William Taylor and myself, if the medical vote has gone up largely, if the establishment has been largely increased, this has been accomplished with a view to increasing your efficiency. But how has it been accomplished? It has been accomplished in virtue of promises and guarantees that it was a wise policy to maintain a large medical establishment, since only by such an establishment can the cost of sickness be diminished, the death-rate be lowered, and invaliding be curtailed. These promises we have made. It is for you officers of the Royal Army Medical Corps to see that they are redeemed. Much has been done; the figures given to Parliament last year sufficiently acclaim the high efficiency of the Corps in these directions, but much more has to be done, and I beg of you, therefore, to lay yourselves out for these high administrative functions, because upon you depend entirely whether the guarantees of your chiefs are to be made good or not. But if to-night I speak in praise of what we have together accomplished, there are points upon which I would rather dwell, since they concern some of our remaining defects. There still exist traces of our departmental origin; the very fact that there is a Director-General at all, is an indication of that. After all, a Director-General must be regarded as a vestigial structure of older days. The Medical Corps exists for war, and from the outset we laid ourselves out to improve the purely professional work of the Corps, its medicine, its surgery, its research, and its higher education; and since these things have now been accomplished, and are plain to the world, and are every day becoming plainer, we have arrived at the time when the adaptability of the Medical Corps for war must claim our whole attention. Recent changes in the army, a better system of training, and a higher conception of the functions of a medical corps point the way. Two facts alone indicate the necessity for the art of war claiming our special attention. We have had lately created by Mr. Haldane a General Staff, consisting of a highly intellectual body of staff officers, whose duty it is to study all the organisations for war, at home and abroad, and who have specially paid considerable attention to the relation of a medical service to an army in the field. These officers are studying your problems. See that you study them, too. It has been said that there is no literature in our language bearing upon these matters. Gentlemen, whose fault is this? Who could have written this literature for the officers of the Royal Army Medical Corps? Why has it not been written? Why have you and I and all of us been found wanting in this particular?

"Let us not look backwards, but let us look forward and see that in the future the Medical Corps of the Army recognises their importance, lay themselves out for the study of their problems, and in a word become what they really are—soldiers. Another change which has taken place under the guidance of the same Minister, has been the creation of the medical service of the Territorial Force. I may, perhaps, with some pride, and I hope with propriety say, that at the outset I recognised the enormous importance of this movement. For long years the medical profession in this country regarded their relation to war as a purely humanitarian one, and it was all a question of medicine and surgery and aid to the sick and wounded. Important as these functions are, they are of little real importance in the fighting and winning of battles. The necessity for the education of this profession I have long seen to be one of the most important problems with which the Medical Corps would have to deal. An opportunity came, the medical profession have risen to the requirements of the case, the importance of the profession of medicine to the efficiency of armies is now well recognised. The Territorial Medical Service is becoming a highly-efficient organisation, and the officers of that Service have laid themselves out with unparalleled zeal for the new functions which have devolved upon them. But look to it, gentlemen, that you take the lead in these affairs; look to it that you become the experts, their guides, and their teachers in these matters. If so much attention can be given by busy men in practice to this important question, how much more time and attention should be given by you whose work it is and whose specific profession these questions involve. However important the purely professional matters with which we may have to deal may be, remember

that sanitation and administration are the most important of all. Much is being done, much has been done to develop this side of our work, but much remains to be done, and it is this fact which constitutes the defect in the existing Medical Corps of which I have spoken. Diminution in the cost of sickness, diminution in hospital admissions, diminution of invalidings and the study of the art of war are the problems of the future. Upon these matters depend your reputation and your glory. What you have done is appreciated, but what you can do is far beyond anything that has been done.

"I have only one more word to say. There are entering the Corps in these days bodies of young men of whom we have great hopes in the future. Remember that we have to hand on to these young men our great traditions—traditions second to none in the army. Kindness, encouragement, support, and advice is what you owe to these young officers. They are to be the future Surgeon-Generals and the future Director-Generals of the Medical Branch. What they learn from you now will never be effaced, but see to it, gentlemen, that these young officers are brought up in the principles of McGrigor and Muir. For all the support you have given me in the past, I thank you. If we have accomplished anything together, it is due rather to the fact that I have been aware of your loyalty and your support to me. I have cared nothing for criticism, for I come from a country and belong to a race which has never feared criticism, and it has never been afraid to stand up before difficulties. I will only reply to one criticism of which I have heard something. It has been stated that I have been too largely in the hands of my staff. This is, I regard, a very great compliment. I have been in their hands completely. My staff has been as loyal as you have been, they have given me every support, and I look upon it as a sound principle of administration that one should delegate one's functions to one's staff if good work and loyal service is to be obtained.

"Once more, gentlemen, let me thank you for your great enthusiasm, which has affected me profoundly."

## ROYAL ARMY MEDICAL CORPS' FUND.

### SEVENTH GENERAL MEETING.

THIS meeting was held at the Royal Army Medical College on Monday, June 14, 1909, at 2 p.m. Surgeon-General Sir Alfred Keogh, Director-General, in the chair.

The Chairman in opening the meeting said, "It is not our custom, I believe, to read the minutes of the last meeting, nor to confirm them, but if any gentleman who would like to make any remarks about the last General Meeting, particulars of which were published in the Journal, we shall be glad to hear them before we proceed to hold this meeting to-day. As there are no remarks, gentlemen, we will proceed to the Seventh Annual General Meeting of the Corps' Fund.

"The finances of the Fund on June 4 stood as follows: In the Royal Army Medical Corps' Fund we had £2,126; in the General Relief Fund we had £501; in the School Fund £921; making a total of £3,548. Of this amount £1,800 stands on deposit, £900 each for the Royal Army Medical Corps Fund and the Compassionate School Fund. We have a sum of £1,100 invested in trust for the General Relief Fund.

"As you know the accounts are published half-yearly in the Corps News. The consideration whether it would be advisable to publish the accounts annually, instead of half-yearly, as at present, should be a question for the Committee to consider.

"During the year there has been an increase in the number of subscribers. In 1908 we had in all 1,070, being an increase of thirty-three over the previous year. There were 181 retired officers in 1908 subscribing, as compared with 178 in 1907. These numbers are approximate, as an officer may pay his subscription on January 1, whilst on the active list, and retire during the year. There are still a large number of officers on the active list who do not subscribe. Junior officers are now joining almost without exception, thanks to the lucid way in which the Commandant of the College places the advantages of the Fund before them. Several officers when they retire cease to become subscribers and so cut themselves adrift from their old colleagues.

"Various sums, amounting to £487, were voted towards the upkeep of the Band during the last year, and the following officers were memorialised during 1908: Guthrie, by a portrait; Tulloch, by a medal; Douglas, by a painting for our V.C. collection; and Williamson, by a tablet in the museum. You will remember, no doubt, the article in

the Journal on that officer. The most important matter we have in hand at the present moment is that connected with Sir James McGrigor. Perhaps all the officers do not know that we have received the statue of McGrigor which is now erected at Chelsea, and we have made arrangements for removing and having it erected in the grounds in front of the College. I think the Corps generally will be pleased to hear that we have done that, and we have spent a considerable sum of money in carrying out the proposal, and in bringing our great Director General 'home.'

"The report of the Sub-Committee of the Dinner Fund was printed in the Corps News for May. Last year 215 attended the Dinner, and it is expected that over 230 will be present at to-night's dinner.

"Surgeon-General Gubbins succeeded Surgeon-General Sloggett on the Sub-Committee, and Major Birrell has taken over the Secretaryship from Major Thurston.

"During the past year two children having attained the age limit have left school, and one more has been admitted. We are now maintaining six children at Homes, and have thirteen free, making up a total of nineteen.

"Now as regards the General Relief Fund, the Committee decided to form a Trust Fund for a sum of £1,100, which we had on deposit. The following Trustees were appointed:—Surgeon-General Keogh, Colonel Wardrop, Mr. Vesey Holt, and a Trust Deed was drawn up for a sum of £1,100.

"There is a suggestion made, gentlemen, to which I think it is worth while drawing your attention, viz., that the small hospitals throughout the districts should do a little more towards helping this Fund. We get considerable help from the officers in charge of larger stations, notably South Africa, every year, and especially during the last year; but a large number of the small hospitals throughout the districts, appear to give nothing. I suggest that these hospitals should try and make a small grant, if even only to the extent of a few shillings, from which we should derive considerable benefit. They have no regimental institutions of their own, and they use the institutions of the Corps at the depôts, and something might be done if the smaller stations were to subscribe to the headquarter stations to enable them to make their donations larger than at present. We depend on the donations of the officers and men for this Fund.

"There is a suggestion in the Secretary's notes as to the sums which might be given, but I think it is hardly possible to lay down anything of the kind, because some of the stations have half a dozen men, and some only two or three, but something ought to be done.

"There is yet another point which, in the interests and economy of the various units, I ought to bring before you, and it is this: We now undertake to subscribe to all the military charities we think deserving of special support. It is not necessary that any of your institutions should subscribe to any of the charities to which the Corps' Fund subscribes. Some units outside subscribe to various charitable associations to which we also subscribe, and which means a subscription twice over.

"We now subscribe to the Union Jack Club; we pay the subscription, and we do that without putting any extra tax upon the Corps, and that alone gives us a certain claim for the consideration of the smaller stations. The smaller stations use the Club, and they get the benefit of the Corps' subscription for nothing. We also subscribe to the Corps of Commissionaires, and Soldiers' and Sailors' Help Association, the Society for Employment of Discharged Soldiers, the Drummond Institute, and other charities, such as the South African Soldiers' Grave Fund, &c. There is no need to subscribe to any of these or others. If a Commanding Officer considers any society worth helping in his district, all he has to do is to write to the Committee. I think it is rather overlapping if we subscribe twice over.

"Last year we passed a resolution granting £50 to the College towards the entertainment of distinguished guests. I do not know how much of this has been spent, but no grant is required this year. I rather think the Commandant has made arrangements. I think it is a question whether the Corps should not itself arrange as a Corps, and not leave it to those living in London to arrange for the entertainment of distinguished guests coming to London, as hitherto. I think we have done our duty in the matter, but hardly as a Corps. We have spent a good deal of money on entertainment.

"Another resolution was passed last year, that as the majority of our officers give nothing to the General Relief Fund, a grant should be made annually from the Corps at the Annual General Meeting.

"Gentlemen, that is all I have to say with regard to these matters. I think, on the whole, the Fund is in a very flourishing condition, and we have put by money for a rainy day; but if we are engaged in a war, there is no doubt we cannot continue to feel secure unless we can get more money. There are still a considerable number of senior



officers who do not subscribe at all. I do not think it is necessary to say that those who do not subscribe are wanting in *esprit de corps*, and I should like you senior officers to mention this question outside to those who do not subscribe. I do not know who they are, but I have had to bring this before your notice every year that I have taken the chair at this meeting, and I think it is not very creditable that there should be any non-subscribers to a Corps' Charity. Gentlemen, this is all I have to say on the subject. The Secretary will now bring forward the proposals, and the Committee will be delighted to hear your views, and will be very glad to have any proposals you desire to make."

Lieut-Colonel Harris (Secretary): "The only resolution we require this year, gentlemen, is a vote for the General Relief Fund. Last year we passed a resolution that a grant be given to the General Relief Fund, according to the state of the finances at the time. Well, the General Relief Fund last year was in a very satisfactory condition, but as years go on, and with the education of the children, we shall not, perhaps, be in such a satisfactory condition. This year we only require a small grant, but the idea is to keep before you the resolution made at the last General Meeting, so that when finances are not so flourishing we should, if occasion call for it, be able to meet a larger demand."

"I would suggest a grant for this year of ten guineas."

Colonel Wilson proposed a grant of ten guineas to the General Relief Fund. This was seconded by Major Spencer, and carried unanimously.

As there were no further proposals, the Chairman brought the meeting to a close.

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## ARMY MEDICAL OFFICERS' BENEVOLENT SOCIETY.

PROCEEDINGS of the Annual General Meeting held at 3 p.m., June 14, 1909, at the Royal Army Medical College.

### *Present.*

Surgeon-General Sir Alfred Keogh, K.C.B. (in the chair).

Colonel D. Wardrop; Surgeon-General P. M. Ellis; Lieutenant-Colonel Hackett; Colonel Harwood; Major Birrell; Captain Clapham; Lieutenant-Colonel W. G. Macpherson, C.M.G.; Colonel W. T. Martin; Lieutenant-Colonel W. M. Russell; Lieutenant-Colonel S. Hickson; Surgeon-General R. H. Whitehead; Lieutenant-Colonel H. M. Burton; Colonel Jennings.

- (1) The minutes of the last meeting were read and confirmed.
- (2) Proposed by Colonel Wardrop, and seconded by Colonel Jennings, that the Report of the Committee and the Accounts for 1908 be approved. Carried.
- (3) Proposed by Colonel Wilson and seconded by Colonel Martin, that Majors C. G. Spencer and E. T. F. Birrell be appointed members of the Committee, *vice* Colonel J. Lane Notter and Lieutenant-Colonel W. G. Macpherson, who retire by rotation.
- (4) It was proposed by Colonel W. T. Martin, and seconded by Lieutenant-Colonel Hackett, that Colonels I. H. Whipple, T. Ligertwood, C.B., and J. Lane Notter, be appointed Vice-Presidents. Carried.
- (5) It was proposed by Director-General Sir Alfred Keogh, K.C.B., and seconded by Colonel R. Jennings, that the following grants recommended by the Committee be approved: Three orphans of D. O. D., £40; orphan of R. D., £30; orphan of C. Q., £25; orphan of D. K. C., £30; two orphans of W. S. L., £30; orphan of R. W. T., £25; orphan of M. Q., £20; orphan of J. F., £25; orphan of D. A., £30; two orphans of H. W. M., £30; two orphans of W. J. C., £40; orphan of A. S., £10; orphan of H. T. C., £20; orphan of J. O., £25; orphan of W. F. I., £30; two orphans of W. F. F., £30, and McGrigor's Pension, £10; orphan of T. B., £25; orphan of B. S., £20; orphan of H. H. S., £20. Total, £515.
- (6) Lieutenant-Colonel W. G. Macpherson proposed, and Lieutenant-Colonel Hackett seconded, the following resolution, that: "Rule 8 be brought before the Committee for consideration, with a view that subscribers of amounts under one guinea be entitled to attend the Annual General Meeting, and vote at the same." Carried.
- (7) A vote of thanks to the Chairman was carried unanimously.

# ARMY MEDICAL OFFICERS' BENEVOLENT SOCIETY.

## STATEMENT OF ACCOUNTS FOR THE YEAR 1908.

RECEIPTS.		EXPENDITURE.	
	£ s. d.		£ s. d.
To Balance, January 1, 1908—		By Donations given by—	
In Bank .. ..	100 19 5	Annual General Meeting .. ..	490 0 0
Cash .. ..	9 10 0	Committee .. ..	42 10 0
		Secretary .. ..	5 0 0
Subscriptions .. ..	110 9 5	" Secretary's Salary, September 30, 1907, to Sep-	
" One Year's Dividend, 3 % Debenture Stock L. & N. W.	191 9 0	" tember 30, 1908 .. ..	37 10 0
" Railway (less tax £10) .. ..	190 0 2	" Clerical Assistance .. ..	26 0 0
" One Year's Dividend, 3 % Debenture Stock North		" Bankers' Charges .. ..	0 4 6
" Eastern Railway (less tax £10) .. ..	189 19 8	" Auditor .. ..	1 1 0
" One Year's Dividend, 2½ % Debenture Stock Midland		" Royal United Service Institution, 1907 .. ..	0 10 6
" Railway (less tax £8) .. ..	152 0 0	" Furniture .. ..	1 19 6
" One Year's Dividend, 4 % Debenture Stock Cale-		" Printing .. ..	1 14 4
" donian Railway (less tax £5 11s. 2d.) .. ..	105 12 10	" Postage .. ..	2 4 0
" One Year's Dividend on £462 7s. 6d., 2½ % Consols	10 19 8	" Stationery .. ..	2 12 11
" Rebate on Income Tax .. ..	81 13 0	" Balance in Bank .. ..	420 17 0
	£1,032 3 9		£1,032 3 9

INVESTMENTS.		£	s.	d.
L. & N. W. Railway 3 % Debenture Stock	..	6,667	0	0
Midland " 2½ %	..	6,400	0	0
N. Eastern " 3 %	..	6,666	0	0
Caledonian " 4 %	..	2,780	0	0
Consols, 2½ %	..	462	7	6
		£22,975	7	6

We have compared the above statement with the books and papers relating thereto, and certify the same to be correct. We have verified the balance at the Bank, and have inspected the Certificates of the Investments in Railway Stock as set out, and we are taking steps to verify the Consols inscribed at the Bank of England.

Portland House, Basinghall Street, E.C.,  
January 6, 1909.

(Signed) EVANS, PIERSON & CO.,  
Chartered Accountants.

## REPORT OF THE COMMITTEE FOR THE YEAR 1908.

There were 170 subscribers for the year, being an increase of seven over the previous year. The total receipts for 1908 were £921 14s. 4d., as compared with £820 17s. 4d. in 1907, the increase being chiefly due to the recovery of two and a-half years' rebate of income tax amounting to £81 13s. The expenditure for 1906 amounted to £611 6s. 9d., and that in 1907 to £834 2s., but the latter sum included £200 invested in Consols.

During the year a sum of £537 10s. was granted to 23 applicants, representing 33 orphans, as compared with £567 15s. given in 1907 to 22 applicants, representing 31 orphans.

The value of the investments on December 31, 1908, was as follows:—

£	s.	d.					£	s.	d.
6,667	0	0	L. & N.W. Railway 3 % Debenture Stock at 91 ..	..	..	6,066	19	4	
6,400	0	0	Midland „ 2½ „ „ 73 ..	..	..	4,672	0	0	
6,666	0	0	N. Eastern „ 3 „ „ 88 ..	..	..	5,866	1	7	
2,780	0	0	Caledonian „ 4 „ „ 115 ..	..	..	3,197	0	0	
462	7	6	Consols			388	7	10	
<hr/>									
£22,975	7	6				£20,190	8	9	

F. W. H. DAVIE HARRIS, *Lieutenant-Colonel*,  
*Secretary.*

## LIST OF SUBSCRIBERS TO THE ARMY MEDICAL OFFICERS BENEVOLENT FUND FOR THE YEAR 1908.

Major S. A. Archer; Miss Allan; Captain G. W. Aviss; Major E. T. F. Birrell; Major W. F. Black; Colonel W. Babbie; Colonel J. F. Brodie; Major J. M. Buist; Lieutenant-Colonel J. Battersby; Major T. B. Beach; Surgeon-General G. D. Bourke, C.B.; Captain C. A. J. A. Balck; Major F. W. Begbie; Captain W. W. Browne; Captain L. Bonsfield; Lieutenant J. E. M. Boyd; Deputy-Surgeon-General J. S. Comyn; Captain J. H. Campbell; Surgeon-General A. F. Churchill; Lieutenant-Colonel H. E. Cree; Lieutenant-Colonel A. B. Cottell; Colonel T. M. Corker; Major A. J. Chambers; Major S. L. Cummins; Captain F. W. Cotton; Captain A. Chopping; Captain G. B. T. Churchill; Lieutenant-Colonel G. Cree; Surgeon-General Sir Charles Cuffe, K.C.B.; Lieutenant J. T. Clapham; Colonel Sir James Clark, Bart; Lieutenant V. T. Carruthers; Lieutenant F. Casement; Lieutenant-Colonel A. M. Davies; Colonel J. R. Dodd, Mrs. A. E. Davidson, Surgeon-General W. Donovan, C.B.; Surgeon-General J. G. H. Evatt; Major P. Evans; Lieutenant-Colonel H. P. J. Elkington; Colonel P. M. Ellis; Lieutenant A. C. Elliott; Surgeon-General T. W. Fox; Captain P. H. Falkner; Major A. A. Fitzgerald; Lieutenant-Colonel R. H. Firth; Surgeon-General W. J. Fawcett; Major E. C. Freeman; Captain F. M. Foulds; Major J. Forrest; Lieutenant-Colonel H. J. Fletcher; Major E. C. P. Fowler; Lieutenant-Colonel R. J. Fayle; Surgeon-Major General C. H. Girard; Major J. Girvin; Lieutenant-Colonel J. S. Green; Colonel G. T. Goggin; Colonel R. J. Geddes; Lieutenant R. W. Galway; Captain J. E. H. Gatt; Lieutenant H. G. Gibson; Lieutenant-Colonel R. J. D. Hackett; Captain A. E. Hamerton; Lieutenant-Colonel F. W. O. H. Hamilton; Major W. E. Hardy; Captain H. Herrich; Lieutenant-Colonel R. H. Hall; Captain F. H. Hardy; Major E. M. Hassard; Captain G. W. G. Hughes; Lieutenant-Colonel R. Holyoake; Major Horrocks; Lieutenant-Colonel F. W. H. D. Harris; Surgeon-General C. A. Innes; Lieutenant-Colonel J. M. Irwin; Lieutenant-Colonel R. Jennings; Lieutenant-Colonel W. Johnston, C.B.; Colonel H. E. R. James; Major R. W. H. Jackson; Lieutenant-Colonel F. W. C. Jones; Colonel J. W. Jones; Major J. C. Jameson; Lieutenant-Colonel M. D. Kirkpatrick; Lieutenant-Colonel M. Knox; Surgeon-General Sir A. Keogh, K.C.B.; Colonel W. Kenny; Captain W. D. C. Kelly; Colonel T. Ligertwood, C.B.; Lady Longmore; Lieutenant-Colonel W. L. Lane; Captain P. S. Lelean; Captain W. N. Long; Lieutenant W. E. C. Lunn; Lieutenant J. du P. Langrishe; Lieutenant W. F. M. Loughnan; Colonel W. T. Martin; Captain A. M. MacLoughlin; Lieutenant-Colonel W. G. Macpherson, C.M.G.; Major James Moir; Major W. T. Mould; Colonel H. W. Murray; Lieutenant-Colonel H. S. McGill; Colonel W. A. May, C.B.; Surgeon-General W. H. McNamara, C.B.; Colonel F. J. McNecce; Major F. M. Mangin; Captain A. J. McDougall; Captain T. C. Mackenzie; Major G. S. MacLoughlin; Lieutenant-Colonel R. N. Macpherson; Lieutenant-Colonel C. W. S. Magrath; Colonel H. Martin; Lieutenant-Colonel H. J. R. Moberley; Captain A. H. Morris; Lieutenant O. R. McEwen; Colonel C. G.

Mosse; Lieutenant D. F. Mackensie; Colonel J. Lane Notter; Captain G. S. Nickerson, V.C.; Captain F. H. Noke; Major H. J. Pocock; Major C. E. Pollock; Major F. J. W. Porter; Captain C. W. Profeit; Captain J. E. Powell; Lieutenant-Colonel R. Porter; Major H. S. Peeke; Lieutenant-Colonel G. F. Poynder; Major J. Paterson; Captain E. C. Phelan; Lieutenant-Colonel E. J. E. Risk; Lieutenant-Colonel H. D. Rowan; Surgeon-General S. B. Roe, C.B.; Lieutenant-Colonel M. W. Russell; Lieutenant G. F. Rugg; Lieutenant-Colonel C. C. Rielly; Captain F. E. R. Robinson; Surgeon-General E. N. Sinclair; Major A. E. Smithson; Colonel C. Seymour; Captain H. C. F. Stallard; Captain E. P. Sewell; Lieutenant-Colonel B. Skinner, M.V.O.; Lieutenant-Colonel A. A. Sutton, D.S.O.; Colonel A. T. Sloggett, C.M.G.; Major C. G. Spencer; Major H. E. Staddon; Major E. B. Steele; Captain F. A. Stephens; Captain M. Swabey; Captain S. B. Smith; Major C. G. G. Stalkart; Lieutenant J. A. B. Sims; Surgeon-General T. W. Trevor, C.B.; Surgeon-General Sir E. Townsend, K.C.B.; Lieutenant-Colonel C. J. W. Tatham; Lieutenant W. T. Thompson; Lieutenant-Colonel R. J. Windle; Lieutenant-Colonel J. B. Wilson; Colonel D. Wardrop; Lieutenant-Colonel J. G. Williamson; Colonel T. P. Woodhouse; Surgeon-General J. A. Woodfreys; Colonel H. R. Whitehead; Captain A. D. Waring; Captain B. Watts; Lieutenant-Colonel G. E. Weston; Captain M. G. Wynder; Colonel J. H. C. Whipple; Miss L. E. Warren; Major J. C. Weir; Captain A. H. O. Young.

## THE ARMY MEDICAL OFFICERS' WIDOWS' AND ORPHANS' FUND.

*This Society was instituted in January, 1816.*

*President.*—Surgeon-General Sir A. Keogh, M.D., K.C.B., K.H.P., Director-General.

*Vice-Presidents.*—Deputy Surgeon-General C. A. Innes, M.D.; Deputy Surgeon-General W. G. Don, M.D.

*Trustees.*—Lieutenant-Colonel J. Martin; Lieutenant-Colonel J. Stevenson, M.D.; Deputy Surgeon-General C. A. Innes, M.D.

*Committee for 1909-10.*—Surgeon-General Sir W. D. Wilson, K.C.M.G.; Lieutenant-Colonel W. Grant Macpherson, M.D., C.M.G.; Lieutenant-Colonel A. M. Davies; Lieutenant-Colonel M. W. Russell; Surgeon-General W. S. M. Price; Colonel J. Lane Notter, M.D.; Major E. L. McSheehy, M.D.; Lieutenant-Colonel A. F. S. Clarke, M.D.; Major W. H. Horrocks, M.B.

*Auditors.*—Messrs. Deloitte, Plender, Griffiths and Co., Chartered Accountants.

*Consulting Actuary.*—H. W. Andras, Esq., F.I.A.

*Honorary Treasurer.*—Sir James R. D. McGrigor, Bart.

*Secretary.*—Captain J. T. Clapham, 16, Tedworth Gardens, Chelsea, S.W.

The Ninety-fourth Annual General Meeting was held at the Royal Army Medical College on Monday, May 17, 1909.

### *Present.*

Surgeon-General Sir Alfred Keogh, K.C.B., K.H.P., President, in the chair.

Deputy-Surgeon-General W. G. Don, Vice-President; Surgeon-Generals Sir Charles Cuffe, K.C.B., and W. L. Gubbins, C.B., M.V.O.; Colonels W. T. Martin and D. Wardrop; Lieutenant-Colonels A. M. Davies, A. F. S. Clarke, W. B. Leishman, W. Grant Macpherson, C.M.G., J. Martin, G. F. Poynder, and M. W. Russell; Major E. L. McSheehy.

The advertisement in the *Times* convening the Meeting was read by the Secretary.

The minutes of the previous Annual General Meeting were read and confirmed.

The report and accounts for the year ended December 31, 1908, were submitted and adopted. A copy of these has been sent to members.

The election by the Committee, under Rule XXI., of Captain J. T. Clapham as Secretary, *vice* Colonel T. Ligertwood, C.B., resigned, was sanctioned.

Major W. H. Horrocks was elected to fill the vacancy on the Committee caused by the appointment of Captain J. T. Clapham as Secretary.

Messrs. Deloitte, Plender, Griffiths and Co. were appointed auditors for the year 1909-10.

The Meeting considered that the appointment of an agent for transactions with

the National Debt Commissioners in the place of Colonel T. Ligertwood, resigned, was a matter for decision by the Trustees, and agreed with the proposal of the latter to appoint Sir C. R. McGrigor, Bart., and Co., as such agent.

On the motion of the Chairman, seconded by the Vice-President, Deputy-Surgeon-General W. G. Don, it was determined unanimously:—

“That this meeting desires to convey to Colonel T. Ligertwood, M.D., C.B., its sincere regret at his resignation of the Secretaryship on account of ill-health, and wishes to record its appreciation of the many and valuable services he has rendered to the Society during the thirty-three years for which he has held that office.”

A vote of thanks to the Chairman was then passed, and the meeting ended.

#### REPORT AND ACCOUNTS FOR THE YEAR 1908.

*Report of the Committee to the Members of the Army Medical Officers' Widows' and Orphans' Fund.*

GENTLEMEN,—Your Committee have the pleasure to report on the affairs of the Society, and to submit the Accounts for the year 1908.

During the year the only changes in the investments of the Funds have been as follows:—

*Old Account.*—The sum of £3,329 10s. 10d. has been invested with the National Debt Commissioners, and the sum of £2,000 withdrawn from them for payment of Annuities.

*New Account.*—The sum of £664 19s. 10d. has been invested with the National Debt Commissioners, and the sum of £1,000 withdrawn from them for payment of Annuities.

The sum of £2,000 12s. has been invested in the purchase of £2,060 Three and a Half per cent. Debenture Stock, East India Railway.

The total value of the Stock Exchange Securities in the accompanying Balance Sheet is £18,468 16s. 7d. and the same Securities had an aggregate market value at December 31, 1908, of £18,049 4s. 7d.

Your Committee will be obliged if the Members will bring the advantages and strong financial position of the Society to the notice of their brother officers who have not yet joined the Fund. A Book of Rules containing tables of rates of subscription and particulars of benefits can be obtained from the Secretary.

Your Committee regret having to announce the resignation of Colonel T. Ligertwood, C.B., on account of ill-health, and desires to place on record their appreciation of the valuable services which he has rendered to the Society during the thirty-three years of his Secretaryship.

*War Office, S.W.,  
April 22, 1909.*

*W. S. M. PRICE, Surgeon-General, A.M.S. (Retired),  
Chairman of the Meeting of this date.*

The Committee especially call the attention of Members who are in arrears with their subscriptions to Rule XIII. of the Society. Subscriptions should be paid to the Bankers of the Fund, Sir C. R. McGrigor, Bart., and Co., 25, Charles Street, St. James' Square, S.W.

#### NOTICE.

Attention is invited to the benefits offered by the above Society, which have been much improved by the amendment of the rules in 1906. It is hoped that officers considering the question of life assurance will investigate the strong financial condition of the Fund, and compare its terms with those offered by other societies. In so doing it must be borne in mind that *these terms cover all war and climate risks.*

Under the new rules the widow's annuity of £50 is continued after her death to her child, or children, until the youngest surviving child shall have attained the age of twenty-one years. Further, should the wife of a member predecease him, it is optional for him to continue the subscriptions which he has been paying, to provide for her children up to the age of twenty-one, in the event of his death. A new scale of subscriptions has been brought into force, of which some examples are given below. Some difference in age between husband and wife is here assumed, but as the disparity in age is less the rate of subscription is proportionately lowered. Where the wife is the elder it is still further decreased.

# ARMY MEDICAL OFFICERS' WIDOWS' AND ORPHANS' FUND.

ACCOUNTS FOR THE YEAR 1908.

*In the form prescribed for the Annual Return of a Registered Friendly Society.)*

## (A) BENEFIT FUND.

Dr.	INCOME.	£	s.	d.	EXPENDITURE.	Cr.
	Contributions for Benefits—				Widows' Annuities (after deducting Income Tax) ..	£ 3,375 18 10
	Subscriptions for Widows' and Orphans' Fund ..	£	s.	d.	Annuities to Widows in advance ..	50 0 0
	Marriage Fines ..	1,223	16	11	Income Tax on Annuities ..	180 3 7
		45	17	0	Interest on £4,431 19s. 7d. (balance of Management Fund at the end of the year 1907) at 3 per cent. ..	132 19 2
	Interest on Investments of Benefit Funds (less Tax deducted, £27 4s. 6d.) ..	1,269	13	11		
		4,556	8	6	Total Expenditure ..	£3,739 1 7
	Total Income ..	£5,826	2	5	Amount of Benefit Fund at the end of the year as per balance sheet (C) ..	126,719 14 3
	Amount of Benefit Fund at the beginning of the year as per last Return ..	124,632	13	5		
		£130,458	15	10		£130,458 15 10

*N.B.*—The Items of Income and Expenditure in the above Account are the amounts *due and payable* in the year 1908.

## (B) MANAGEMENT FUND.

Dr.	INCOME.	£	s.	d.	EXPENDITURE.	Cr.
	Interest for one year on £4,431 19s. 7d. at 3 per cent. ..	132	19	2	Salaries and Office Allowance ..	210 0 0
		£132	19	2	Printing, Stationery, Postages, &c. ..	9 19 0
	Total Income ..	£132	19	2	Actuary's Fee ..	10 10 0
	Management Fund at the beginning of the year (as per last Return) ..	4,431	19	7	Auditor's Fee ..	10 10 0
					Counsel's Fee ..	7 7 0
					Total Expenditure ..	£248 6 0
					Amount of Management Fund at the end of the year as per Balance Sheet (C) ..	4,316 12 9
						£4,564 18 9

*N.B.*—The Items of Income and Expenditure in the above Account are the amounts *due and payable* in the year 1908.

(C) BALANCE SHEET OF FUNDS AND EFFECTS, AS AT DECEMBER 31, 1908.

DR.	LIABILITIES.			ASSETS.			CR.		
	Total Benefit Funds, as per Account (A)	..	£ s. d.	Rate per cent. of Interest yielded.	£	s.	d.		
Amount of Management Fund, as per Account (B)	..	..	126,719 14 3						
Other Liabilities—			4,316 12 9						
Income Tax deducted from Annuities ..	..	..	180 3 7						
Secretary's Salary and Office Allowance (from October 1 to December 31, 1908) ..	..	..	52 10 0						
Actuary's Fee ..	..	..	10 10 0						
(1) In the Public Funds—									
Two and a Half per Cent. Consols, £4,917 18s. 10d. ..	..	..		£2 15 0	4,468	9	10		
(2) With the Commissioners for the Reduction of the National Debt—									
Old Account, at 2½d. per cent. per diem ..	..	..		3 16 0½	89,335	19	3		
New Account, at 2½d. per cent. per diem ..	..	..		3 0 10	21,802	5	4		
(3) Other Securities—									
London and North-Western Railway Three per Cent. Debenture Stock	£5,000	0 0	3 19 8		3,763	9	6		
Caledonian Railway Four per cent. Debenture Stock ..	1,449	0 0	3 14 9		1,550	14	4		
Midland Railway Two and a Half per Cent. Debenture Stock ..	7,827	5 7	2 18 7		6,685	10	11		
Three and a Half per Cent. East India Railway Debenture Stock, £2,060 ..	..	..	3 12 0		2,000	12	0		
Cash at Bankers ..	..	..		..	1,672	9	5		
			<u>£131,279 10 7</u>		<u>£131,279 10 7</u>				

We have examined the above Balance Sheet and Accounts with the Books and Vouchers of the Society and certify that it is in accordance therewith. The Securities, and Cash Balances, have been verified by us.

*b, London Wall Buildings,  
Finsbury Circus, London, E.C.  
April 20, 1909.*

DELOITTE, PLENDER, GRIFFITHS & CO.  
*Chartered Accountants.*



Husband's age, 25	..	Wife's age, 25	..	Ann. Sub., £12	6	5	
"	"	27	..	"	12	14	1
"	"	30	..	"	14	1	5
"	"	32	..	"	14	19	7
"	"	35	..	"	16	14	5
"	"	37	..	"	17	10	9
"	"	40	..	"	18	17	7
"	"	45	..	"	21	8	6

There is a class of unmarried members who pay £2 a year. They are allowed the equivalent of the total of their subscriptions, at compound interest, by way of reduction of their annual subscription when becoming married members. There are no marriage fines for members joining under the new rules.

At the last quinquennial valuation of the assets and liabilities of the Fund, as at December 31, 1905, the Actuary reported that "the financial position of the Society was eminently satisfactory"; there being a net surplus of £64,390 after providing for annuities, immediate and contingent, to all widows of members.

The Funds of the Society at that date amounted to £125,419. On December 31, 1908, their total value was £131,279; of this sum £89,335 is invested with the Commissioners for the reduction of the National Debt at a rate of £3 16s. 0½d. per cent. per annum.

At the end of the 1908 there were 126 members, of whom 14 were unmarried.

A copy of the Rules, the latest Annual Report, and other particulars can be obtained from the Secretary, Captain J. T. Clapham, 16, Tedworth Gardens, Chelsea, S.W.

## ROYAL ARMY MEDICAL CORPS, WARRANT OFFICERS AND SERJEANTS (PAST AND PRESENT) ANNUAL DINNER CLUB.

### *President:*

Surgeon-General Sir Alfred Keogh, K.C.B., M.D., K.H.P.

### *Vice-Presidents:*

Surgeon-General W. L. Gubbins, C.B., M.V.O., M.B.

Lieutenant-Colonel C. E. Nichol, D.S.O., M.B.

The members of the Club held their first Annual Meeting at the Serjeants' Mess, Millbank Barracks, London, S.W., on Saturday, May 8, for the purpose of reviewing the accounts of the previous year and electing a Committee for the ensuing year.

The Hon. Secretary read the following statement of accounts, which was passed unanimously.

<i>Receipts.</i>	£ s. d.	<i>Expenditure.</i>	£ s. d.
By Cash from 241 Members' joining fees .. ..	12 1 0	To Printing and Stationery ..	5 13 11
„ Cash from 241 Members' Annual Subscriptions ..	12 1 0	„ Postage .. ..	1 12 11
„ Cash for Dinner Tickets ..	29 15 0	„ Cost of Dinner and Musical Programme ..	34 11 5
		„ Miscellaneous Expenses ..	0 8 6
			£42 6 9
		Cash in hand .. ..	11 10 3
	£53 17 0		£53 17 0

Balance credit .. .. £11 10 3

N. FERGUSON, *Lieutenant-Colonel, R.A.M.C.,*

*for Hon. Treasurer,*

C. H. SMITH, *Serjeant-Major, R.A.M.C.,*

Audited and found correct,

JAS. CLARK, *Serjeant-Major, R.A.M.C.*

} *Hon. Treasurers.*

May 8, 1909.



The undermentioned were then elected to serve on the Committee for the ensuing year:—

*President :*  
Serjeant-Major W. T. Spencer.

*Hon. Treasurers :*  
Major H. S. Thurston ; Serjeant-Major C. H. Smith.

*Members :*

Mr. A. Mallord	Quartermaster-Serjeant R. Cox
Quartermaster-Serjeant W. Wilson	Mr. J. Genese
Mr. W. S. Towers	Staff-Serjeant W. Hicks

*Hon. Secretary :*  
Staff-Serjeant E. J. Harris.

#### NOTICE.

Since the list of members published in the Corps News for May, pp. 125-126, was compiled, the undermentioned have joined the Club:—

Quartermaster-Serjeant A. G. Audus, Staff-Serjeant W. H. Chudleigh, Staff-Serjeant J. Sallis, Serjeant J. Black, Mr. Legg, Serjeant-Major F. Clark, Quartermaster-Serjeant J. R. Kenshole, Quartermaster-Serjeant A. P. Barnard, Quartermaster-Serjeant J. McEvoy, Quartermaster-Serjeant M. Powell, Quartermaster-Serjeant A. Fitch, Quartermaster-Serjeant J. H. Curtayne, Staff-Serjeant A. Horn, Staff-Serjeant B. D. Conolly, Staff-Serjeant H. W. Rose, Staff-Serjeant A. Pitchforth, Serjeant J. Fraser, Serjeant E. J. Lovegrove, Serjeant J. Worswick, Serjeant A. E. Malley, Serjeant C. Primer, Serjeant G. Darling, Serjeant G. Skinner, Staff-Serjeant H. Sprinks, Serjeant J. Nye, Serjeant F. Bird, Lance-Serjeant W. Munden, Serjeant F. Evans, Serjeant-Major B. S. Gledhill, Mr. F. J. Spary, Mr. E. J. Warwick, Serjeant W. Gamblen, Mr. G. E. C. Riding and Serjeant G. R. Morris.

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#### BIRTHS.

FRENCH.—May 21, 1909, at 81, The Common, Woolwich, the wife of Major Herbert C. French, R.A.M.C., of a son.

GRATTAN.—On June 9, at Wimbledon, the wife of Major H. W. Grattan, R.A.M.C., of a daughter.

JAMESON.—May 22, at 1, Southampton Terrace, South Farnborough, the wife of Captain A. D. Jameson, R.A.M.C., of a daughter.

MOORE.—On May 17, at 66, The Common, Woolwich, the wife of Major George A. Moore, M.D., R.A.M.C., of a son.

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#### DEATHS.

WILSON.—On May 15, 1909, at Guildford, Brigade-Surgeon James Wilson, M.B., F.F.P.S.Glasgow, Retired Pay, A.M.S., aged 73. He entered the Service August 5, 1858; became Surgeon A.M. Department, March 1, 1873; Surgeon-Major, A.M.D., April 1, 1873; Brigade-Surgeon, A.M.S., May 7, 1889; Retired Pay, February 14, 1891. His war services were as follows: Afghan War, 1878-80; Hisarak Expedition; mentioned in Despatches, Medal, Egyptian Expedition, 1882. Medal, bronze star.

IEVERS.—On June 3, 1909, Major Philip Glover Ievers, late R.A.M.C. (retired), aged 56. He entered the Service September 30, 1875; retired on gratuity, October 28, 1885; promoted Major on Retired List, October 18, 1902.

McDOWELL.—The date of death of Major Frederick McDowell was August 6, and not July 6, as previously stated.

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## EXCHANGES, &c.

*The charge for inserting Notices respecting Exchanges in the Royal Army Medical Corps is 5/- for not more than five lines, which should be forwarded by Cheque or P.O.O., with the notice, to Messrs. G. STREET and CO., Ltd., 8, Serle Street, London, W.C., not later than the 22nd of the month.*

•

In the event of Reprints or "Excerpts" of articles being required by the authors, notification of such must be sent when submitting the papers. Reprints and Excerpts may be obtained at the following rates, and additional copies at proportionate rates :—

NUMBER OF REPRINTS	NUMBER OF PAGES	COST OF REPRINTS	COST OF EXCERPTS *	EXTRA FOR COVERS FOR REPRINTS			
				As Journal, Printed on Front	As Journal, Plain, Unprinted	Cheaper Paper, Printed on Front	Cheaper Paper, Plain, Unprinted
		£ s. d.	£ s. d.	s. d.	s. d.	s. d.	s. d.
12	4	0 2 6	0 1 0	3 6	0 11	3 2	0 7
	8	0 4 6	0 2 0				
	16	0 7 6	0 3 6				
25	4	0 3 0	0 1 3	4 0	1 3	3 6	0 9
	8	0 5 6	0 2 6				
	16	0 9 6	0 4 6				
50	4	0 4 0	0 1 8	5 0	1 9	4 0	1 0
	8	0 6 9	0 3 2				
	16	0 12 0	0 5 3				
100	4	0 5 6	0 2 9	6 6	3 3	5 6	2 0
	8	0 9 0	0 4 4				
	16	0 16 9	0 6 9				
200	4	0 8 6	0 4 0	9 0	6 3	7 6	4 0
	8	0 13 6	0 6 0				
	16	1 3 6	0 8 9				

\* These are not arranged as Reprints, but appear precisely as in the Journal with any other matter that in the Journal may happen to appear on the first and last pages of the particular excerpt ordered.

**CASES FOR BINDING VOLUMES.**—Strong and useful cases for binding can be obtained from the publishers at the undermentioned rates:—

Covers, 1s. 4d. net; binding, 1s. 2d.

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*All Applications for Advertisements to be made to—*

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The back outside cover is not available for advertisements.

## Notices.

### EDITORIAL NOTICES.

The Editor will be glad to receive original communications upon professional subjects, travel, and personal experiences, &c. He will also be glad to receive items of news and information regarding matters of interest to the Corps from the various garrisons, districts, and commands at home and abroad.

**All such Communications or Articles accepted and published in the "Journal of the Royal Army Medical Corps" will (unless the Author notified at the time of submission that he reserves the copyright of the Article to himself) become the property of the Library and Journal Committee, who will exercise full copyright powers concerning such Articles.**

Matter intended for the Corps News should reach the Editor not later than the 15th of each month for the following month's issue. Notices of Births, Marriages, and Deaths are inserted free of charge to subscribers and members of the Corps. All these communications should be written upon one side of the paper only; they should by preference be type-written, but, if not, all proper names should be written in capital letters (or printed) to avoid mistakes, and be addressed The Editor, "JOURNAL OF THE ROYAL ARMY MEDICAL CORPS," War Office, Whitehall, London, S. W.

Communications have been received from Lieutenant H. T. Treves, Lieutenant G. J. Keane, Lieutenant-Colonel A. R. Aldridge, Major C. E. Pollock, Lieutenant-Colonel T. du B. Whaithe, H. M. W. Gray, Major C. F. Wanhill, Lieutenant W. E. Marshall, Captain J. G. Churton, Captain H. A. Emerson, Major M. P. C. Holt, Lieutenant-Colonel W. G. Macpherson, Major W. H. Horrocks, Surgeon-Captain Robert Samut, Major F. J. Wade-Brown, Captain L. W. Harrison, Captain L. Bousfield, Captain J. A. W. Webster, Captain A. B. Smallman, Colonel L. E. Anderson, Major S. F. Clark, Serjeant-Major C. W. Kinsella.

The following publications have been received:—

*British: Medical Press and Circular, The Hospital, The Lancet, Army and Navy Gazette, The Australasian Medical Gazette, Indian Medical Gazette, The Royal Engineers' Journal, The St. Thomas's Hospital Gazette, Journal of the Royal Sanitary Institute, Guy's Hospital Gazette, The Transvaal Medical Journal, Public Health, On the March, St. Bartholomew's Hospital Journal, Red Cross and Ambulance News, The Medical Review, The Practitioner, Proceedings of the Royal Society of Medicine, The British Medical Journal, The Antelope, The Middlesex Hospital Journal, The Journal of Tropical Medicine and Hygiene, The Journal of Tropical Veterinary Science, The General Practitioner, The Lister Institute of Preventive Medicine, Sleeping Sickness Bureau, Journal of the Royal United Service Institution, Travel and Exploration.*

*Foreign: Deutsche Militärärztliche Zeitschrift, Archivos de Hygiene e Pathologia Exoticas, Giornale di Medicina militare, Le Mois Medico-Chirurgical, Revista de Sanidad militar y La Medicina Militar Española, Japanese Medical Journal, Archives de Médecine et de Pharmacie, Le Caducée, The Military Surgeon, Archives de Médecine Navale, Archiv für Schiffs- und Tropen-Hygiene, Bulletin of the Johns Hopkins Hospital, Yellow Fever Institute Bulletin, United States Public Health Service, Boletín de Sanidad militar, Annales d'Hygiène et de Médecine Coloniales, Archives de l'Institut Pasteur de Tunis, Norsk Tidsskrift for Militærmedicin, Bulletin de l'Institut Pasteur, Annali di Medicina Navale e Coloniale, American Medicine, Russian Medical Journal.*

## MANAGER'S NOTICES.

The JOURNAL OF THE ROYAL ARMY MEDICAL CORPS is published monthly, six months constituting one volume, a volume commencing on 1st July and 1st January of each year.

The Annual Subscription is £1 (which includes postage), and should commence either on 1st July or 1st January; but if a subscriber wishes to commence at any other month he may do so by paying for the odd months between 1st July and 1st January at the rate of 1s. 8d. (one shilling and eightpence) per copy. (All subscriptions are payable in advance.)

Single copies can be obtained at the rate of 2s. per copy.

The Corps News is also issued separately from the Journal, and can be subscribed for at the rate of 2s. (two shillings) per annum, including postage. Subscriptions should commence from 1st July each year; but if intending subscribers wish to commence from any other month, they may do so by paying for the odd months at the rate of 2d. per copy. (All subscriptions are payable in advance.)

**Officers of the Royal Army Medical Corps possessing Diplomas in Public Health, &c., are kindly requested to register their special qualifications at Headquarters. Letters of complaint are frequently received from officers stating that their special qualifications have not been shown in the Distribution List which is published as a supplement to the Journal in January and July of each year. As, however, the particulars of this list are supplied from official sources, officers are reminded that unless the possession of Diplomas, &c., has been registered at Headquarters, no entry of such qualifications can be recorded in the Distribution List.**

**Letters regarding non-delivery of the Journal, or change of address, should be sent to the Hon. Manager, "Journal of the Royal Army Medical Corps," War Office, Whitehall, London, S.W., and reach there not later than the 25th of each month.**

**It is requested that all Cheques or Postal Orders for Subscriptions to the Journal, Corps News, Reprints, &c., be crossed "Holt & Co.," and made payable to the "Hon. Manager, Journal R.A.M.C.," and not to any individual personally.**

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THE HON. MANAGER,  
"JOURNAL OF THE ROYAL ARMY MEDICAL CORPS,"  
WAR OFFICE, WHITEHALL, S.W.

# JOURNAL OF THE ROYAL ARMY MEDICAL CORPS.

## Corps News.

AUGUST, 1909.

### ARMY MEDICAL SERVICE.

Colonel Octavius Todd, M.B., is placed on retired pay, dated July 1, 1909. He entered the Service March 6, 1880; became Surgeon-Major, M.S., March 6, 1892; Lieutenant-Colonel Royal Army Medical Corps, March 6, 1900; Colonel (local rank) whilst Principal Medical Officer of Division F.F. South Africa, May 2, 1900; Lieutenant-Colonel Royal Army Medical Corps under Article 365 Pay Warrant, June 26, 1902; Colonel Royal Army Medical Corps, April 4, 1906. His war services are as follows: South African War, 1900-02. Principal Medical Officer of Division and Principal Medical Officer 14th General Hospital. Relief of Ladysmith, including operations of February 5 to 7, 1900, and action at Vaal Kranz; operations on Tugela Heights (February 14 to 27, 1900), and action at Pieter's Hill. Operations in Natal, March to June, 1900, including action at Laing's Nek, June 6 to 9. Operations in Transvaal, May and June, 1900. Despatches (Sir R. H. Buller, June 19 and November 9, 1900), *London Gazette*, February 8, 1901, and July 29, 1902. Queen's medal with five clasps; King's medal with two clasps.

The King has been graciously pleased to make the following appointments to the Royal Victorian Order, to take effect from the dates noted:—

To be Commanders: June 24, 1909. Colonel Charles Edward Harrison, Honorary Surgeon to His Majesty, Brigade Surgeon-Lieutenant-Colonel Grenadier Guards.

June 24, 1909. Colonel Douglas Wardrop, Commandant and Director of Studies, Royal Army Medical College.

The King has been graciously pleased on the occasion of the celebration of His Majesty's Birthday to give orders for the following promotions in, and appointments to, the Most Honourable Order of the Bath:—

To be Ordinary Members of the Military Division of the Third Class, or Companions, Surgeon-General Hayward Reader Whitehead, Principal Medical Officer, Southern Command.

### ROYAL ARMY MEDICAL CORPS.

His Majesty the King has been pleased to confer the honour of Knighthood upon Lieutenant-Colonel W. B. Leishman, M.B., R.A.M.C.

Lieutenant-Colonel Herbert J. R. Moberly, from the Royal Army Medical Corps, to be Colonel, *vice* O. Todd, dated July 1, 1909.

Lieutenant Francis W. M. Cunningham, from the Seconded List, is restored to the establishment, dated June 29, 1909.

School of Instruction: Major Charles C. Fleming, D.S.O., M.B., Royal Army Medical Corps, to be Instructor, *vice* Major J. D. Ferguson, D.S.O., dated June 13, 1909.

The undermentioned Quartermasters and Honorary Lieutenants are granted the honorary rank of Captain:—

George H. Panton, Royal Army Medical Corps, dated June 24, 1909.

Henry S. Brook, Royal Army Medical Corps, dated July 12, 1909.

**APPOINTMENTS.**—Lieutenant-Colonel J. McLaughlin (Retired Pay R.A.M.C.), Recruiting Medical Officer, Belfast; Lieutenant-Colonel A. de C. Scanlan (Retired Pay

R.A.M.C.), Medical Charge, Guildford; Lieutenant-Colonel C. R. Tyrrell, as Administrative Medical Officer, Bordon District; Lieutenant-Colonel M. W. Russell, as Staff Officer to Principal Medical Officer, Eastern Command; Lieutenant-Colonel D. L. Irvine, as Staff Officer to Administrative Medical Officer, North Midland Division Territorial Force; Major T. H. M. Clarke, C.M.G., D.S.O., Medical Inspector of Recruits, Southern Command; Major E. C. Hayes, Sanitary Officer, Eastern Command; Captain R. S. H. Fuhr, D.S.O., Charge of Military Families' Hospital, Woolwich.

**POSTINGS.**—Lieutenant-Colonel W. B. Day (H.P.) to Western Command; Captain A. F. Weston to Southern Command.

**EXCHANGES ON FOREIGN SERVICE ROSTER, &c.**—Lieutenant-Colonels R. I. D. Hackett and C. R. Tyrrell. Lieutenant-Colonels H. Carr and D. M. Saunders. Captains J. W. Leake and R. F. Ellery. Captains W. M. Power and W. J. P. Adye-Curran. Captains H. B. G. Walton and R. T. Brown.

**INCREASED PAY.**—Lieutenant-Colonel D. V. O'Connell has been selected for increased pay with effect from July 1 inclusive.

**ARRIVALS HOME ON LEAVE.**—From Gibraltar: Colonel H. W. Murray; Majors H. A. Berryman and H. V. Prynn. From Malta: Major C. E. Pollock; Captain H. St. M. Carter. From India: Majors M. Boyle and H. A. Hinge; Captain R. L. Argles; Lieutenant C. T. Edmunds. From Bermuda: Lieutenant-Colonel J. Culling.

**DIPLOMAS.**—Captain F. S. Penny has obtained the Diploma in Public Health, Royal College of Physicians and Surgeons, London.

**QUALIFICATION.**—Captain J. M. M. Crawford obtained F.R.C.S.I., 1903.

**EMBARKATION.**—Captain D. J. F. O'Donoghue for West Coast of Africa.

**TRANSFERS.**—Lieutenant-Colonel Sir J. Fayer, Bart., from Duke of York School to London District, pending embarkation for China; Captain R. S. H. Fuhr, D.S.O., from London District to Eastern Command; Captain W. M. McLoughlin from London District to Aldershot Command; Captain W. L. Bennett from Scottish Command to Western Command.

#### **LIST OF TOUR-EXPIRED OFFICERS TO BE RELIEVED AT STATIONS ABROAD DURING THE COMING SEASON.**

Lieutenant-Colonels R. H. S. Sawver; E. J. E. Risk; F. P. Nichols; F. J. Jencken; W. W. Pike, D.S.O.; G. Wilson; J. M. Reid; W. C. Beevor, C.M.G.; J. R. Forrest; H. A. Haines; G. E. Hale, D.S.O.; W. T. Swan; C. T. Blackwell; P. C. H. Gordon; H. D. Rowan; H. Cocks; F. W. G. Gordon-Hall; A. Kennedy; H. P. G. Elkington; H. M. Adamson; A. R. Aldridge; D. M. O'Callaghan; J. F. Donegan; R. Holyoake; T. du B. Whaithe; F. S. Le Queene, V.C.; A. L. F. Bate. Majors E. A. Burnside; B. J. Inniss; R. C. Thacker; A. J. Luther; H. E. Winter; J. W. Jennings, D.S.O.; C. Dalton; T. McDermott; W. D. Erskine; H. W. K. Read; A. F. Tyrrell; H. A. Berryman; D. J. Collins; J. B. Anderson; J. R. McMunn; A. E. Master; E. S. Clark; K. M. Cameron; J. E. Carter; M. Boyle; P. Evans; C. K. Morgan; John M. Buist; F. Kiddle; J. Grech; St. J. B. Killery; G. T. K. Maurice; H. Hewetson; W. E. Hudleston; M. MacG. Rattray. Captains M. D. Ahern; H. S. Anderson; A. S. Arthur; J. H. Brunskill; J. G. Berne; G. E. Cathcart; G. B. Carter; R. T. Collins; P. H. Collingwood; N. E. Dunkerton; J. H. Douglass; H. H. A. Emerson; P. Farrant; J. Fairbairn; F. J. Garland; M. F. Grant; E. M. Glanvill; P. J. Hanafin; A. J. Hull; H. Harding; R. B. Hole; H. C. Hildreth; C. H. Hopkins; S. O. Hall; T. E. Harty; O. Ievers; R. R. Lewis; T. C. Lucas; S. E. Lewis; F. C. Lambert; E. H. M. Moore; J. T. McEntire; W. McD. MacDowall; R. H. MacNicol; S. M. W. Meadows; F. H. Noke; A. C. Osburn; A. L. Otway; F. M. M. Ommanney; S. L. Pallant; B. G. Patch; A. M. Rose; J. D. Richmond; C. R. Sylvester-Bradley; J. A. Turnbull; F. J. Turner; W. F. H. Vaughan; D. P. Watson; W. Wiley; M. C. Wetherell; E. C. Whitehead; T. J. Wright; C. J. Wyatt; A. H. O. Young.

#### **DISTRIBUTION OF THE LIEUTENANTS ON PROBATION, ROYAL ARMY MEDICAL CORPS, FIRST JUNIOR COURSE, 1909.**

*Aldershot Command.*—Lieutenants R. H. Nolan, M. White, and W. B. Rennie.

*Eastern Command.*—Lieutenants H. H. Leeson, A. W. Bevis, R. C. Priest, H. F. Joynt, and J. Beckton.

*Irish Command.*—Lieutenants J. J. D. Roche, P. C. M. Elvery, A. S. M. Winder, and J. R. Yourell.

*Southern Command.*—Lieutenants S. C. Walker, P. S. Tomlinson, O. W. McSheehy, R. C. Paris, and M. J. Williamson.

*Scottish Command.*—Lieutenants J. A. Manifold, S. S. Dykes, and G. P. Taylor.

*Western Command.*—Lieutenants J. R. Hill, C. L. Franklin, and A. D. Stirling.

*London District.*—Lieutenants J. A. Clark, H. S. Ranken, and E. C. Lambkin.

\* To undergo the Aldershot course of instruction with the next batch of Lieutenants, Royal Army Medical Corps.

#### LIST OF CASUALTIES:—

*Discharges.*—6799 Serjeant-Major A. Harwood, June 26, 1909, to pension; 9095 Quartermaster-Serjeant H. H. Taylor, June 14, 1909, at own request after eighteen years; 8141 Serjeant T. Davey, June 26, 1909, termination of second period; 278 Private A. Hume, June 12, 1909, medically unfit; 17731 Private H. T. Lee, June 18, 1909, at own request after eighteen years; 1735 Private H. C. Lush, June 29, 1909, medically unfit; 11505 Private F. D. Grahame, July 8, 1909, termination of first period; 11387 Private H. A. W. Bignell, July 8, 1909, free after twelve years.

*Transferred to Army Reserve.*—15771 Private A. E. Robson, June 10, 1909; 310 Private H. L. Noble, June 13, 1909; 15784 Private A. E. Harbour, June 11, 1909; 326 Private G. D. Bampton, June 17, 1909; 300 Private G. T. Goble, June 8, 1909; 15774 Private J. McDonald, June 9, 1909; 338 Private G. Kerley, June 21, 1909; 360 Private C. McRae, June 24, 1909; 15846 Private W. Wright, June 25, 1909; 16454 Lance-Corporal S. A. McCartney, June 25, 1909; 370 Private C. Bloor, July 2, 1909; 367 Private E. L. Finch, July 1, 1909; 364 Private A. Morrall, July 1, 1909; 380 Private L. J. Hort, July 3, 1909; 15864 Private W. Gale, July 3, 1909; 390 Private R. Paul, July 6, 1909; 15907 Private C. H. Ashbrook, July 9, 1909; 15908 Private G. Holland, July 9, 1909; 395 Private H. B. Browne, July 9, 1909; 15904 Private A. Seeley, July 6, 1909; 397 Private L. R. Young, July 9, 1909; 15905 Private J. Baker, July 8, 1909.

*Transferred to other Corps.*—9088 Staff-Serjeant C. Parnell, June 22, 1909, to 1st Welsh Field Ambulance.

#### DEATHS.

16476 Corporal H. Page, June 21, 1909, at Gibraltar; 16556 Private J. Neville, July 6, 1909, at Portland.

#### PROMOTIONS.

9263 Quartermaster-Serjeant W. Brennan, June 27, 1909, to be Serjeant-Major, *vice* A. Harwood to pension.

#### APPOINTMENTS.

To be Lance-Corporals (Special), under para. 281 S.O., Royal Army Medical Corps: 18865 Private J. Ward, June 14, 1909; 18657 Private V. Tripp, June 18, 1909; 18988 Private R. H. T. Haigh, June 18, 1909; 19192 Private F. Poole, June 18, 1909; 19595 Private C. E. Bull, June 18, 1909; 1859 Boy W. R. Green, June 15, 1909, appointed Bugler.

*Transferred from other Corps.*—2281 Private T. Edington, June 1, 1909, from King's Own Scottish Borderers.

#### THE FOLLOWING N.C.O.'s AND MEN HAVE QUALIFIED FOR PROMOTION IN THE VARIOUS CORPS EXAMINATIONS.

*For Quartermaster-Serjeant.*—11000 Staff-Serjeant W. H. Storey.

*For Staff-Serjeant.*—7746 Serjeant G. O. Cowthard.

*For Serjeant.*—18850 Corporal G. W. Eagles; 14326 Corporal W. P. S. Morman.

*For Corporal.*—19607 Private R. C. Pottow, 18200 Private W. G. Collings, 19234 Private E. Thurgar, 19515 Private G. D. Salter, 453 Private T. R. Owen, 743 Private F. C. Coles.

#### THE FOLLOWING QUALIFIED AS DISPENSERS OF MEDICINE AT THE EXAMINATION HELD ON MAY 17 AND 18, 1909.

19863 Private W. H. Mattison, 16325 Corporal A. F. Gibbs, 12989 Corporal E. G. W. Barnes, 18110 Corporal R. W. Gibson, 18634 Corporal F. H. Galton, 18821 Private G. Weston, 12589 Corporal A. Harris, 18890 Corporal J. Moore, 14326 Corporal W. P. S. Morman, 12411 Corporal A. A. Sims, 18657 Private V. Tripp, 19966 Private G. V. Chatten, 19192 Private F. Poole, 18988 Private R. H. T. Haigh, 19595 Private C. E. Bull, 15027 Corporal W. Bush, 17794 Lance-Corporal W. A. Beckett, 19618 Private P.



Bettison, 19025 Corporal F. C. Bovey, 19933 Private W. C. Savegar, 18253 Corporal J. Suter, 12651 Corporal R. H. Bennett.

#### DISSEMBARKATIONS FROM ABROAD.

19637 Private R. F. Ennor, May 18, 1909, from Singapore, per H.M.S. "Andromeda"; 11593 Private T. L. Bootes, June 16, 1909, from South Africa, per ss. "Galician."

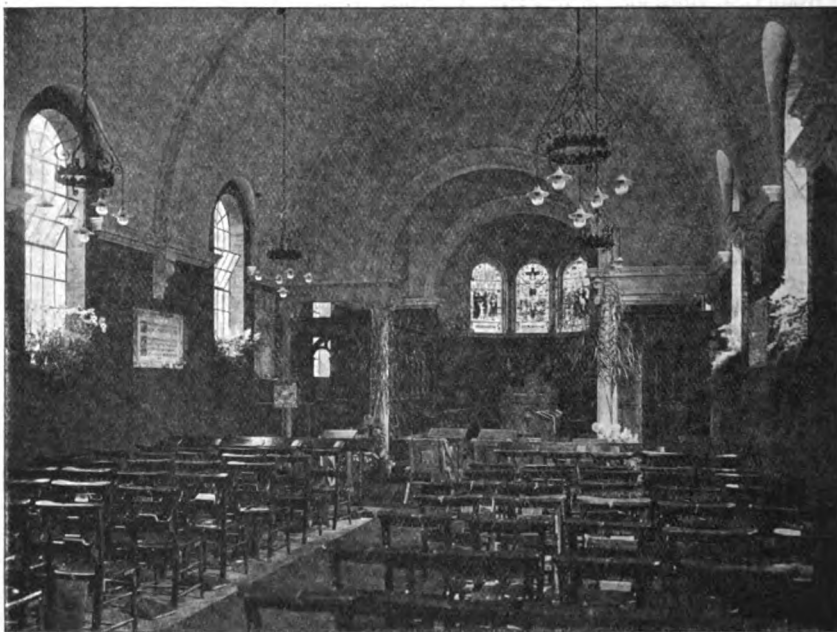
#### EMBARKATIONS FOR ABROAD.

To Sierra Leone: 16053 Serjeant S. M. Gawthorne, June 18, 1909; 18969 Corporal E. Grey, June 18, 1909; 751 Lance-Corporal A. J. Milne, June 18, 1909; 19683 Private W. H. Mattison, June 18, 1909.

#### NOTES FROM THE LONDON DISTRICT:—

##### ROYAL VISIT TO THE QUEEN ALEXANDRA MILITARY HOSPITAL, MILLBANK.

On June 24, The Queen Alexandra Military Hospital was honoured by a visit from their Majesties the King and Queen, on the occasion of the dedication of the new Chapel for the use of the patients and staff of the Hospital. The chapel was erected at the expense of anonymous donors. The style of architecture is Byzantine, and the building is simple and effective. There are three handsome stained glass East Windows, and on the walls are two alabaster tablets, one to the memory of Sister Georgina Mary, of Clewer, who presented the communion table, sacramental plate, credence table and harmonium, and the other in memory of "all who have passed to their rest in the military hospitals in London." A third tablet, in the chancel, is to the memory of members of the Queen Alexandra's Imperial Military Nursing Service.



CHAPEL OF THE QUEEN ALEXANDRA MILITARY HOSPITAL, MILLBANK.

Their Majesties the King and Queen, accompanied by Her Royal Highness the Princess Victoria, arrived at the Hospital at 12 noon, and were met by Field-Marshal His Royal Highness the Duke of Connaught and Her Royal Highness the Duchess of Connaught.

In attendance upon the King and Queen were the Lady Suffield and the Hon.

Charlotte Knollys (Ladies-in-Waiting), the Earl Howe (Lord Chamberlain to the Queen), the Lord Acton, the Hon. Sidney Greville, Lieutenant-Colonel F. Ponsonby, and the Hon. John Ward (Lord Groom and Equerries-in-Waiting).

Their Royal Highnesses the Duke and Duchess of Connaught were attended by Miss A. E. Pelly and Captain T. R. Bulkeley.

Their Majesties were received at the main entrance to the Hospital by Major-General the Hon. F. W. Stopford (General Officer Commanding the London District), Surgeon-General Sir Alfred Keogh (Director-General Army Medical Service), and by Colonel D. Wardrop (Commandant, Royal Army Medical College), Colonel C. E. Harrison, and Miss C. H. Keer (Matron-in-Chief, Queen Alexandra's Imperial Military Nursing Service), who had the honour of being presented to the King and Queen by the General Officer Commanding the London District. The Matron, Miss E. M. McCarthy, presented a bouquet to the Queen, and Staff-Nurses Burgess and Eardley presented bouquets to Princess Victoria and the Duchess of Connaught.

The King and Queen passed through the main corridor of the Hospital to the chapel and were met by the Right Rev. Bishop Taylor-Smith, D.D. (Chaplain-General to the Forces), and conducted to seats in the chancel.

The special service was conducted by Bishop Taylor-Smith, assisted by the Rev. J. Hackett, D.D. (Chaplain, Chelsea Barracks), and the Rev. Ralph L. White (Chaplain, Wellington Barracks). The music was supplied by the voluntary choir of the Guards Chapel and part of the band of the Scots Guards. The dedication was pronounced by the Chaplain-General in the following words: "To the Glory of Almighty God, as a memorial of all who have passed to their rest in the Military Hospitals of London, we dedicate this chapel."

Amongst those present at the service were Field-Marshal Earl Roberts, Countess Roberts, the Deputy-Director-General, Army Medical Service (Surgeon-General Gubbins), and Mrs. Gubbins, Mrs. Wardrop, Mrs. Harrison, Colonel Granville Smith (A.A. and Q.M.G., London District), Lady Blanche Smith, the Medical and Nursing and Consulting Staffs of the Hospital, the Professors of the Royal Army Medical College, the Officers Commanding Battalions of Foot Guards, the Medical Officers of Battalions of Foot Guards, Major-General Lord Cheylesmore, Viscountess Downe, Lady Wynne, &c., &c.

After the service their Majesties, with the rest of the Royal party, attended by Surgeon-General Sir Alfred Keogh, Colonel Wardrop, Colonel Harrison, and the Matron, and followed by Earl and Countess Roberts and others, visited ward B, where a number of the hospital patients had been collected. The King and Queen spoke to several of the men and showed the greatest interest in their progress and welfare.

The Royal party then signed their names in the visitors' book and left the Hospital about 1 p.m.

A Guard of Honour of the 2nd Battalion Scots Guards, with the colours and band of the regiment, under the command of Major the Hon. H. J. Fraser, was mounted at the entrance to the hospital.

**NOTES FROM WOOLWICH.**—Lieutenant-Colonel J. S. Davidson, R.A.M.C., writes:—

"*Royal Army Medical Corps Officers' 'At Home.'*"—An 'At Home' given by Lieutenant-Colonel W. Dick and the Officers of the Royal Army Medical Corps, in the grounds of the Royal Herbert Hospital, on June 28, was a great success. Some 250 guests were present, and probably many more would have come if the weather had been more settled. In spite of threatening clouds we were, however, lucky enough to have one of the few dry days in an unusually wet month for our entertainment. The Royal Army Medical Corps Band was present during the afternoon, and rendered an excellent programme in a most masterly style. Two lady palmists were in attendance for such as wished to divine their future, and were in much request, one of them being engaged till 8 p.m. A Variety Entertainment was also given in the Hospital Theatre, which was much appreciated. This was one of those reunions, where one had an opportunity of meeting many old friends and comrades, some still in the Service and some in the quieter walks of retirement. Refreshments were catered for by Buszard and Co.

Serjeant-Major R. H. Green, R.A.M.C., writes:—

"*Annual Sports.*"—After lying dormant for ten years we are glad to think that there has been a revival of the custom of Annual Sports in the companies in Woolwich.

"On June 29 we had a most successful day's sport, of which the following programme of events, prizes and winners will give some idea:—

## "PROGRAMME.

Event	Prizes	Winners
(1) Throwing the Cricket-ball	{ 1st, Oxidised swing clock .. .. 2nd, Tobacco pouch, silver mounted..	{ Pte. Hammond. Pte. Steedman.
(2) High Jump .. ..	{ 1st, Silver-mounted clock .. .. 2nd, Carriage clock .. ..	{ Pte. Moore. Pte. Parker.
(3) Prize Ring .. ..	Case of razors (presented by Capt. Crawford)	Serjt. Musgrave.
(4) Putting the Shot .. ..	{ 1st, Case of hair brushes .. .. 2nd, Pipe in case .. ..	{ Corpl. Campion. Pte. Allbeury.
(5) Long Jump .. ..	Calendar clock .. ..	Pte. Collyer.
(6) Potato Race .. ..	{ 1st, Case of razors .. .. 2nd, Inkstand .. ..	{ Pte. Breeds. Corpl. Campion.
(7) Children's Races resulted as follows ..	{ Girls: Dora Godman, Winnie Green, and Dolly Arnold. Boys: W. Sheppard, C. Pegg, and R. Smith. (Suitable prizes were awarded.)	
(8) Boot Race .. ..	{ 1st, Elephant clock .. .. 2nd, Tobacco pouch, silver-mounted..	{ Pte. Eaton. Corpl. Campion.
(9) Veterans' Race .. ..	{ 1st, Carriage clock .. .. 2nd, Case of hair brushes .. ..	{ Staff-Serjt. Wilkins. Pte. Billington.
(10) 100 Yards Flat Race	{ 1st, Dressing case .. .. 2nd, ——— .. ..	{ Pte. Allbeury. Pte. Leonard.
(11) Cuddy Fighting ..	Two pipes in cases .. ..	{ Ptes. Allbeury and Hort.
(12) Sack Race .. ..	{ 1st, Barrell clock .. .. 2nd, Briar pipe in case.. ..	{ Pte. Hogan. Pte. Brunton.
(13) 220 Yards Flat Race	{ 1st, Dressing case .. .. 2nd, Shaving outfit .. ..	{ Pte. Allbeury. Pte. Leonard.
(14) $\frac{3}{4}$ -Mile Flat Race ..	{ 1st, Gilt clock .. .. 2nd, Case of razors .. ..	{ Pte. Harding. Pte. Murphy.
(15) Bucket of Water Race	Morocco writing case .. ..	Pte. Hogan.
(16) Tug-of-War (8-aside)	{ 1st, Four oxidised cigarette cases and four briar pipes in cases and #1 added	No. 19 Room.
(17) Mop Fighting ..	Two razors in cases .. ..	{ Ptes. Reid and Thomas.
(18) Band Race .. ..	{ 1st, Silver-mounted photograph frame 2nd, Pair of salt-cellar .. ..	{ Bdsman. Chittenden. Band-Serjt. Pugh.
(19) Consolation Race ..	{ 1st, Pair of salt-cellar .. .. 2nd, Tobacco pouch, silver-mounted..	{ Pte. Minchin. Pte. Whitbread.
(20) Ladies' Race.. ..	{ 1st, Work-basket .. .. 2nd, Glove and handkerchief set ..	{ Mrs. Hunt. Mrs. Arnold.

"A special prize for winner of most events, a silver watch presented by Lieutenant-Colonel J. S. Davidson, was won by Private Allbeury.

"A Stretcher Drill and First-Aid Competition was also in the list of events, but owing to a downpour of rain at the time it was fixed to take place, this was postponed till July 2, when the following squads were eventually successful after a two and a half hours hard test:—

"1st Prize.—Four chased silver matchboxes, presented by the Administrative Medical Officer, Lieutenant-Colonel W. Dick, were won by Corporal Royals, Privates Allbeury, Harding, and Hort.

"2nd Prize.—Four silver-mounted cabinet photo frames, presented by the Matron, Miss Russell, were won by Lance-Corporal Jones, Privates Haley, Audus, and Spiers.

"3rd Prize (Consolation). 10s., also presented by the Administrative Medical Officer, won by Privates Mouncey, Garvey, Woods, and Evans.

"The pulls in the Tug-of-War Competition, the prizes for which were presented by the Company Officers (Majors J. H. Rivers and J. V. Forrest), were well contested between the six barrack-room teams which entered.

"There were just over 200 individual entries exclusive of teams and squads, which necessitated preliminary heats being disposed of the day before.

"The members of the Serjeants' Mess were 'At Home' during the afternoon to a large number of guests.

"The prizes were kindly distributed by Mrs. Dick at the conclusion of each day's events.

"The Corps Band, under Mr. G. P. Robertson, played the following programme at intervals, and many were the complimentary remarks of our visitors on its high efficiency:—

(1) <i>March</i> .. .. .	"Semper Fidelis" .. .. .	<i>Sousa.</i>
(2) <i>Overture</i> .. .. .	"Light Cavalry" .. .. .	<i>Suppe.</i>
(3) .. .. .	Reminiscences of all Nations .. .. .	<i>Godfrey.</i>
(4) <i>Valse</i> .. .. .	"Song d'Automne" .. .. .	<i>Joyce.</i>
(5) .. .. .	"The Warbler's Serenade" .. .. .	<i>Perry.</i>
(6) <i>Selection</i> .. .. .	"Il Trovatore" .. .. .	<i>Verdi.</i>
(7) <i>Scherzo (Piccolo Solo)</i> .. .. .	"Sylvia" .. .. .	<i>Le Thière.</i>
(8) <i>Fantasia</i> .. .. .	"The Water Melon Patch" .. .. .	<i>Birgood.</i>
	"GOD SAVE THE KING."	

"A generally expressed desire from Woolwich is to see a little more of the Corps Band than hitherto.

"Major J. V. Forrest, Captain and Quartermaster G. Hasell, and Lieutenant H. P. Hart, R.A.M.C., kindly acted as judges in the events, and the Sports Committee comprised Serjeant-Major R. H. Green as President; and Serjeants Buckner, Dean and Dunn, Corporals Hearn and Royals, Privates Allbeury, Appleyard, Barnes, Cook, Hardy, Hart, Johnson, Spiers and Walsh, as members.

"*Serjeants' Mess 'Annual Outing.'*—Twenty-six of the thirty-one Serjeants' Mess members spent a most enjoyable day on July 13, when with their wives and families (those who have them) they proceeded to Southend-on-Sea for the day. Leaving Woolwich about 10 a.m. by the pleasure steamer 'London Belle' on a delightful morning and with smooth water, they arrived at Southend about noon, meanwhile having a sumptuous lunch on board before disembarking.

"The party, numbering seventy-five in all, then dispersed in small parties to enjoy themselves, as fancy or fortune led them, amongst the many attractions of this popular pleasure resort.

"They rejoined the 'London Belle' about 6.30 p.m., and immediately sat down to an excellent tea, prepared by special arrangement with the Belle Steamer Company.

"The party arrived at Woolwich on their return journey about 9 p.m., every one being of the same opinion, that they had spent a thoroughly enjoyable time, and that a day at Southend under arrangements such as were made by the Committee (Staff-Serjeants Arnold and Lovett, and Serjeant Court), 'wanted a lot of licking' for a day's holiday."

"*Corporals' 'Annual Outing.'*—The members of the Corporals' Social Club also spent a somewhat similar day to the foregoing at Southend on July 8, and being also favoured with fine weather had an excellent time."

**NOTES FROM SHORNCLIFFE.**—*Opening of the new Military Families' Hospital.*  
 "There was a most interesting scene at Shorncliffe on July 9, when Her Royal Highness Princess Christian of Schleswig-Holstein opened the new Military Families' Hospital.

"The institution, which is intended for the reception of patients from the garrisons of Shorncliffe, Dover, Canterbury, Hythe, &c., was not quite completed in time for the opening. However, it only remains for exterior work and furnishing to be finished, and the Hospital will be used for the purpose for which it has been erected.

"The military authorities at the camp decided to make the ceremony an official one. Her Royal Highness travelled down from London by the Dover boat train, which was stopped for her at Shorncliffe. The station was guarded by a contingent of police drawn from both the county and borough constabulary. She was received by Brigadier-General the Hon. E. J. M. Stuart-Wortley, C.B., C.M.G., M.V.O., D.S.O., and in a motor car drove straight to the Hospital, which is on the Sandgate side of the camp.

"Her arrival was the signal for a royal salute of twenty-one guns by a battery of the Royal Field Artillery.

"Large crowds of civilians and soldiers gathered in the vicinity of the Hospital, but only those bearing invitations or passes were permitted to enter the Hospital grounds. At 11 o'clock there arrived a guard of honour, with the colours of the 1st Battalion Leicester Regiment, and during the time of waiting and the assembling of guests the band of the regiment played several lively airs. As the motor car arrived at the Hospital Her Royal Highness received a salute from the guard of honour, of which, as she passed by, she made an inspection.

"At the main entrance of the building she was received by Lieutenant-Colonel D. V. O'Connell, R.A.M.C. (Senior Medical Officer), and conducted to the general ward.

There all those who had been fortunate enough to receive invitations had gathered, and the sight was a striking one. The newly painted walls, the brilliant and varied uniforms, together with the summer gowns of the ladies, and the nicely arranged plants and flowers, constituted a most interesting and pleasing spectacle.

"Immediately the Princess entered the ward she was presented with a handsome bouquet by Miss Stuart-Wortley, the daughter of the Brigadier, a gift which Her Royal Highness gracefully acknowledged.

"The staff of the Hospital and several of the guests were then presented to Princess Christian by the Senior Medical Officer, after which, followed by the staff, Her Royal Highness made a round of the wards. On her return the Brigadier called upon Major Fairrie to give a short account of the Hospital.

"Major Fairrie then read the following interesting statement: 'On the present auspicious occasion, when we are gathered together under such august patronage, for the initiatory ceremony of this Hospital, some account of the institution in the past, as well as in the present, may prove of interest.

"Shorncliffe was founded as a military camp in 1799, but was not continuously occupied until after the war in the Crimea, when the first permanent garrison replaced the Queen's German Legion. It was therefore at that time that the first hospital for soldiers' wives and children was founded at Shorncliffe. The building so utilised was, in 1856, by no means a new one, having been just then vacated as a residence by the coastguards. The building was of wood, and known locally as the "Black Hut," and had accommodation for fifteen patients. It was demolished about three years ago. However, it for many years appears to have served its purpose extremely well. Miss Nightingale, writing of maternity hospitals in the year 1871, stated that up to 1869, 702 women had been admitted to the Hospital at Shorncliffe. Out of this number only four had died. This must certainly have been a record for those days.

"For the past seven years the Hospital has been situated in a somewhat cramped and antiquated wooden hut, overlooking the site of the original one. In a few weeks' time it is hoped we shall be able to transfer the patients to this more extensive and commodious building.

"Perhaps a few words on the construction of the Hospital may prove of interest. In general plan the Hospital is constructed as a series of wards and rooms built off one long corridor. In the centre are offices, dispensary, waiting-room, and kitchen, dividing the building into two halves, the western half being devoted to maternity purposes, and the eastern half being for the reception of general cases of illness in women and children.

"The room in which we are now assembled is the general ward, which when completely furnished will hold twelve beds. Passing from this ward down the corridor—on the left is the children's ward, on the right are a special surgical ward of one bed and the operating rooms.

"Passing by the kitchen—on the right are stores, and further on three maternity wards of four beds each and two of one bed each. Near the latter, in a small room you may see two fixed baths, specially designed for the washing of babies.

"As outside buildings, there are a small but excellent laundry, an isolation ward of two beds, and quarters for the staff of nurses and servants, who will number thirteen in all. Total accommodation for in-patients, thirty-five.

"In construction this Hospital is a specially light building of the semi-permanent type, of bricks held together by a steel framework, the whole resting on brick and concrete piers. The designers of the Hospital had special difficulties to contend with, as the site—which, by the way, was the only one available—was originally produced by a prehistoric landslide. To guard against the risks of any settlement, a light structure was necessary, and one of a type not easily dislocated. Hence the steel frames holding the structure together. The result of all this, as I have before mentioned, was a building of a semi-permanent character. This in itself is a great advantage, for it is considered by many designers of hospitals that it is folly to construct them on permanent and massive principles, as monuments to posterity. For such buildings are subject to the necessity of periodical reconstruction to keep pace with the ever-advancing ideals of medical and sanitary science.

"The cost of this Hospital has been just over £10,000, giving a rate of £285 a bed.

"I would like to take this opportunity to draw attention to the fact that this Hospital is not for Shorncliffe alone, but is for the whole district. It will receive patients from Dover, Canterbury, Hythe, and other out-stations.

"In connection with the Hospital there is a fund well and generously supported by the corps in the garrison. Part of the fund goes to provide a district nurse, the other

portion being used for the benefit of the inmates of the Hospital. In such benefits patients received from other garrisons of course participate. In this connection we intend to shortly issue an appeal to the corps outside Shorncliffe, throughout the district, and hope for the promise of permanent and suitable subscribers. Under the improved circumstances and the likelihood of the Hospital being able to receive a much greater proportion of cases from outside than has ever been possible before, I think all will admit that it is no longer fair that the income of the fund should continue to be entirely raised in Shorncliffe.

"It is very much to be regretted that the building is not yet quite finished, being still in the hands of the contractors, so that it is not at present possible to obtain any complete idea of the Hospital as it will be when completely equipped and furnished. However, two wards have been furnished, which will show in part what the whole will be like.

"In conclusion, I may safely say that when it has been fitted with all the necessary articles, it will be, for its particular purpose, second to none in the United Kingdom."

"The Rev. J. A. Hatton, B.D., Senior Chaplain to the Forces, then pronounced the Benediction, commending to the care of the Almighty the sufferers who came to the Hospital.

"Princess Christian then said: 'I have great pleasure in declaring this military hospital for soldiers' families open. I hope the work that will be carried on here will prosper.'

"Brigadier-General the Hon. E. J. Montagu Stuart-Wortley said on behalf of the Shorncliffe Garrison, and more especially on behalf of the military families, he had the honour to thank Her Royal Highness most warmly for coming down in that way to open the new Hospital. The kindly interest that Her Royal Highness took in all that pertained to the comfort of the soldiers and their families was well known throughout the Army, and in coming there Her Royal Highness had only added one more proof of her invaluable kindness. On behalf, therefore, of the Shorncliffe Garrison he thanked Her Royal Highness most warmly for coming. He had one request to make of Her Royal Highness, and that was whether they might obtain permission to call the Hospital the Princess Christian Hospital.

"Her Royal Highness graciously gave permission for the institution to be called 'The Helena Hospital' (after her own first Christian name).

"After the ceremony Her Royal Highness proceeded in a motor car to Redoubt House, and lunched with Brigadier-General and Mrs. Stuart-Wortley, returning to London in the course of the afternoon.

"The following ladies and gentlemen were amongst the luncheon party: Brigadier-General the Hon. E. J. Montagu Stuart-Wortley and the Hon. Mrs. Stuart-Wortley, Mrs. Bruce (Lady-in-Waiting), Captain Hankey (Equerry to Her Royal Highness), Miss Keer (Matron-in-chief), Q.A.I.M.N.S., Colonel and Mrs. Scott-Moncrieff, Colonel D. V. O'Connell (Senior Medical Officer), and Mrs. O'Connell, Lieutenant-Colonel Tyndale-Biscoe and Mrs. Tyndale-Biscoe, Lieutenant-Colonel and Mrs. Johnstone, Lieutenant-Colonel Sherer, Lieutenant-Colonel Twyford, Major and Mrs. Hassard, Major and Mrs. S. H. Fairrie, the Rev. J. A. Hatton, Captain Hartigan, and Captain A. H. C. James.

"Amongst those present at the opening ceremony were: Miss Nixon (Matron, Military Hospital), Miss Bishop (Matron of the Helena Hospital), Mrs. Fanshawe, Miss Hatton, and Miss Dixon, Major and Mrs. Hyde, Major C. S. Dodgson, Captain and Mrs. Watt, the Rev. Father and Mrs. Foran, Mrs. Noel Lowe, Monsignor Keatinge, Mr. and Mrs. Clarke, Major McCheane, Mrs. and Miss Wiehe, Colonel and Mrs. Martindale-Vale, Miss Smith, Q.A.I.M.N.S., Miss Taylor, Q.A.I.M.N.S., Colonel and Mrs. Skinner, the Rev. and Mrs. Gell, Dr. and Mrs. Tyson, Mr. and Mrs. Marriatt Dodginton, the Rev. and Mrs. Day, Major and Mrs. Pole-Stuart, Mrs. Barratt, Major and Mrs. White, Dr. and Miss Bradbury, the Rev. R. C. L. Williams, Mr. and Mrs. Budge, Mrs. A. Markham, Mr. and Mrs. O'Connell, the Rev. A. E. and Mrs. Raw, Major A. W. Hooper, Mr. and Mrs. North, Major S. C. S. Dodgson, Miss Gibben, and Miss Waterworth.

"Letters of inability to attend were received from Lilla Countess of Chichester, Sir Edward Sassoon, Bart., M.P., and Lady Sassoon, Admiral and Mrs. Parr, Surgeon-General Sir Alfred and Lady Keogh, Surgeon-General and Mrs. Dorman, and Colonel Crowley.

"The Hospital has been built by Messrs. W. H. Lorden and Sons, of Trinity Road, Upper Tooting."

**NOTES FROM FORT PITT, CHATHAM.**—Serjeant-Major Ford writes under date July 15: "The Annual Outing of the N.C.O.'s Mess, 10th Company Royal Army

Medical Corps, took place on Friday, July 9, 1909. In most favourable weather practically the whole of the Moss and their families attended (about seventy in all). Four brakes left Fort Pitt at 11 a.m., passing through Cuxton, Halling, and Snodland to West Malling, where a halt was made for a light lunch, &c. The party then proceeded through Mereworth Woods to Watlingbury, the Red Lion Hotel being the rendezvous. After refreshing themselves the party made towards the river, where the majority indulged in boating, after which they returned to do justice to a splendid tea which was provided. After tea an impromptu dance was held, which all heartily enjoyed. On the return journey a different route was taken, viz., through Teston, Barming, Maidstone, and Blue Bell Hill, the party arriving home about 11 p.m., after a most enjoyable day.

**NOTES FROM GIBRALTAR.**—*Extract from the "Chronicle":—*

**"28TH COMPANY ROYAL ARMY MEDICAL CORPS OPEN-AIR CONCERT.**

"The 'Weather Clerk' was decidedly kind to the members of the above Company, when, on Wednesday, the 16th inst., favoured by a delightful night, they carried through with marked success their first open-air vocal and instrumental concert of the season. The Royal Army Medical Corps Barrack Square was artistically dressed with flags and bunting for the occasion, the stage especially presenting a very pleasing appearance, being decorated with the flags of many nations, flowers and bunting, amongst which electric lights were tastefully arranged, which, while thoroughly illuminating the stage, had a splendid decorative effect.

"The top of the proscenium was decorated with the Royal Army Medical Corps badge, round which was entwined the French flag as a compliment to the French officers and petty officers from the French cruiser 'Dupuy de Lôme,' who were present.

"In no small measure the marked success of the function was the result of the pleasant way in which the Company combined for the general good, the Committee consisting of Corporals Howell, Buchan, Tomley, and Swann, and Privates Maywood and Salter, under the supervision of Serjeant-Major Dudman, especially doing their share of the preliminary work with a will and thoroughness that left nothing to be desired, and to them a great deal of the success of the venture is due.

"The visitors numbered quite 600 (increasing to about 900 as the evening advanced), including many officers and ladies of the Royal Army Medical Corps and other units, but excluding the "gallery boys" who lined the wall of Windmill Hill Road four deep, overlooking the Square, when at 7.30 p.m. an admirably rendered overture, "La Argentine," by Private Downing, Bedford Regiment, opened the concert. Private Lawrence followed with a sentimental song, 'Bayon,' and gave later, in Part II., 'Sue Sue, Sue,' being well applauded. Lance-Corporal Cragg, an old favourite, then kept the company fully amused with a comic song, 'Don't you think he's Mad,' and, later, gave 'Gallant Deeds,' causing much merriment. Corporals Sore and Reed, Norfolk Regiment, and Mr. Hoskens next entertained the audience with a finely executed mandoline selection, 'Eventide,' gaining much applause, as also did Sapper Suttie, Royal Engineers, in the comic songs 'Dear Mr. Admiral,' and 'I'm One of the Upper Ten.' Mrs. Thompson and Serjeant Dickens, Bedford Regiment, charmed all ears in the ably rendered duet, 'Mother's Song of Long Ago.' In Part II. Serjeant Dickens was also heard to fine expression and effect in his descriptive song, 'It's Pluck, not Luck, that Wins.' Mr. Ryder, Royal Navy, another well-known personality, was exceedingly good in 'John Willie, come on,' and 'Mirth Mixture,' in which the 'mirth' was decidedly a marked feature.

"Quartermaster-Serjeant Flanagan, Royal Engineers, who came next, is to be most heartily congratulated on his beautiful renderings of the 'The Song that Reached my Heart,' 'Alice Where Art Thou?' and, as an encore, 'Dear Heart.' He was in his best voice, and his execution and expression in the former was admirable, his fine voice being heard to perfection. It is not often that we of the 'Rock' are fortunate enough to listen to such fine singing, and he thoroughly merited the continuous applause that rewarded his efforts. Next followed that well-known artist, Corporal 'Tom' Swann, who was in his happiest mood, keeping his audience convulsed with laughter in the new comic song 'King Ki of Kokio,' and 'Don't Take Me Home.' In Part II. he was equally good in 'Jim,' and, though time pressed, his hearers insisted on an encore, when he obliged with 'Toodle Hoodle Eh?'

"Corporal Wells did splendidly in his violin solos, 'The Romance,' by Kellier, and 'Non Neider Ungarn,' by Kéler Béla; as did Mr. Philpot, Royal Navy, who gained great applause for the nicely played cornet solo 'Killarney.'

"Staff-Serjeant Warne, Army Ordnance Corps, caused great merriment by his rendering of Harry Lauder's songs, 'The Safest o' the Family,' and 'She's ma Daisy,' given in the characteristic style of that comedian.

"Serjeant Dickens' (Bedford Regiment) Musical Quintette gave a finely finished rendering of selections from 'Il Trovatore' during the interval.

"The playing of the 'Marseillaise,' and the singing of 'God Save the King,' brought all too soon to a close a most successful evening of 'mirth and merriment, music and sentiment,' on which all the performers are to be congratulated; and that their efforts to entertain were rewarded was evidenced by the hearty applause awarded to one and all.

"It only remains to say that Corporal Swann and Private Salter were most efficient stage managers, and got the performers on the stage without waste of time, and that thanks are due to Private Downing, Bedford Regiment, who accompanied on the piano in his usual sympathetic style."

**NOTES FROM MALTA.**—Captain H. S. Anderson writes: "After the busy month of May, with its burden of examination hopes and fears, June opened with the annual inspection, which was concluded this year on the 14th, shortly after the return of the Principal Medical Officer from Crete.

"Fort Chambray, on the Island of Gozo, has been temporarily reoccupied, after lying empty for nearly three years. Its hospital (non-dieted) is in charge of Lieutenant P. S. Stewart, who is conducting a series of hygiene lectures to the troops. The married quarters at Chambray are beautifully situated, and popular with families in Malta requiring a change.

"The officers' monthly meeting took place on June 16, Colonel J. G. Macneecce presiding. A case of branchial fistula was shown. The correct method of returning 'pappataci fever' was discussed, and attention was drawn to the fact that even for local effects the list of epizoa in the nomenclature does not include a phlebotomus. Elsewhere similar difficulties have been felt, for the *Journal of Tropical Medicine and Hygiene*, June 15, in a leading article, states that the 'Nomenclature of Diseases' for Tropical medicine 'is so obsolete as to be no longer suited for the purposes of the Colonial Office.

"On June 17 the weekly concert at the Soldiers' and Sailors' Institute, Valletta, was given by the Royal Army Medical Corps. The programme was well arranged, and our artistes deserved a larger audience.

"Much interest was taken in a Boxing Tournament provided by the 3rd King's Royal Rifles Corps on June 25, and the chief event was a middle weight 15-round contest between Lance-Corporal Gilmore, K.R.R., and Private Dare, R.A.M.C. The latter was declared the winner after knocking out his opponent in the tenth round.

"Billiards is a most popular recreation at present, and it remains to be seen whether the old rule of the Medical Schools that a good pill player means a bad student applies to 'Numbers 4' at semaphore and other studies. There is perhaps greater comfort in the converse proposition that a good student cannot be a billiard expert.

"The Serjeants take an active part in the Garrison Tennis League, and were 'At Home' on the 17th to the Serjeants and families of the 1st Royal Inniskillen Fusiliers, and on July 1 to the Serjeants and families of 3rd King's Royal Rifle Corps. The grounds at Cottonera are a pleasant oasis, and the Serjeants' Entertainment Club shows skill and ingenuity in utilising them for a variety of games, dancing, &c.

"The June report of the Corps Cricket Captain is attached. The prospects for July would appear to be better, for our team defeated the Detachment of the Devons in a three days' match. Royal Army Medical Corps, Valletta, is still able to raise a detachment XI., which only lost one match out of fifteen played this season.

"This year there is no sign anywhere of summer slackness, and with a temperature only five degrees above that of Paris, sea-bathing does not occupy so much time as usual, but warmer weather may soon be expected, and with it more swimming. The value of all swimmers becoming adepts in 'duck-diving' has been vividly shown by three recent cases of drowning, where the bodies lay at the bottom until retrieved by diving. The Mediterranean Skiff Club flourishes with Captain F. E. Roberts as Hon. Secretary, and the 'Midget' frequently sails to victory. Captain A. E. Weld is designing a faster type, but the Skiff Club rules are strict with regard to design.

"The Malta Technical Training Association has three excellent automobiles, and gives valuable courses of instruction at small cost, with the opportunity of obtaining the R.A.C. certificate. The Officers' Class has become more popular since the privilege of taking out cars at 4d. a mile has been granted to those who pass the examination.



"The prevalence of cool winds from the west and north and occasional light showers have so far kept the climate delightful. It is frequently forgotten that Malta is in the temperate zone, but now the scientist has almost eliminated the sun as a cause of short attacks of fever. Lieutenant H. G. Gibson offered his arm to the 'silent feeder'—only one bite, and the sudden onset of a very unpleasant two days occurred almost at the hour foretold.

"In future the summer fever of newcomers can easily be avoided by using Grassi grease. The island is now a true Pearl, no longer a disease spot, in the Mediterranean oyster, and improvements are noticeable in many directions, although the perambulating goat still swallows street garbage in defiance of ordinances.

"The privilege of eight days' local leave enables officers to visit Africa, Sicily, Naples, and even Rome, and has widened our horizon most agreeably. Short leave to Naples with its surrounding country is a privilege that no one should miss."

Captain Gibbon writes: "We commenced our cricket season on May 22, and since then have played six matches, winning three, drawing one, and losing two. Our wins were with the 3rd Battalion King's Royal Rifles, H.M.S. 'Egmont,' and the Departmental Corps team. We drew with the Colonial Cricket Club, and lost to the Royal Garrison Artillery East, although putting up a good fight, and were badly beaten by the Royal Engineers. Our batting is not too bad when we get going, and there is plenty of bowling talent to choose from, but neither good batting nor bowling can make up for bad fielding, and our fielding is bad. There is always a lament at the end of each game of catches missed and runs thrown away. We will certainly need to show a very marked improvement if we are to win our first round in the Governor's Cup on July 6 and 7, when we meet the Devons."

**NOTES FROM WYNBERG.**—Serjeant-Major C. W. Kinsella, R.A.M.C., writes: "Miss A. Beardsmore Smith, R.R.C., Acting Principal Matron, South Africa, inspected the Wynberg Hospital on June 25.

"Our hockey team visited Rondebosch on Saturday last, and before a large gathering of spectators on the College ground were successful in beating the local Rovers team by 4 goals to 1. Captain P. J. Hanafin is to be congratulated on the excellent form displayed by his team.

"The Secretary of the Royal Sanitary Institute notifies that the name of Serjeant-Major Kinsella is being proposed for election to the Associateship of that Institution.

"Under the auspices of the Technical Instruction Committee of the Cape Peninsula Garrison, a class of candidates for sanitary inspectorships for the November examination has been started, and Serjeant-Major Kinsella, R.A.M.C., has been selected for the post of Instructor. The class consists of seven candidates, six of whom belong to the Corps."

**NOTES FROM SIMLA.**—Lieutenant-Colonel R. S. F. Henderson, R.A.M.C., Secretary to Principal Medical Officer, His Majesty's Forces in India, writes under date June 17, 1909:—

"*Leave.*—Following officers are granted extension of medical certificate leave, ex-India: Lieutenant-Colonel G. E. Hale, D.S.O., from June 18, 1909, to October 17, 1909; Captain C. H. Hopkins, from April 30, 1909, to October 29, 1909.

"*Specialists.*—The following officers are appointed specialists in the subjects named, with effect from the dates of their assuming duties:—

"(b) *Dermatology.*—Captain H. Herrick, 4th (Quetta) Division.

"(c) *Advanced Operative Surgery.*—Lieutenant G. De la Cour, 9th (Secunderabad) Division.

## MILITIA.

CHANNEL ISLANDS: THE ROYAL MILITIA OF THE ISLAND OF JERSEY.

1st or West Battalion (*Light Infantry*).—

## MEDICAL CORPS.

Surgeon-Major Philip B. Bentlif to be Surgeon-Lieutenant-Colonel, dated June 18, 1909.

## SPECIAL RESERVE OF OFFICERS.

ROYAL ARMY MEDICAL CORPS.

### *Supplementary List.*

Robert Magill, M.B., to be Lieutenant (on probation), dated June 7, 1909.

Alexander McKillop, M.B., to be Lieutenant (on probation), dated June 17, 1909.

## TERRITORIAL FORCE.

### ROYAL ENGINEERS.

*1st Wessex Field Company, Wessex Divisional Engineers.*—Surgeon-Major Joseph Fuller resigns his commission, and is granted permission to retain his rank and to wear the prescribed uniform, dated May 25, 1909.

### INFANTRY.

*5th Battalion, the Loyal North Lancashire Regiment.*—Surgeon-Captain Henry James Taylor, from the 2nd Volunteer Battalion, the Loyal North Lancashire Regiment, to be Surgeon-Captain, with precedence as in the Volunteer Force, dated April 1, 1908.

### ROYAL ARMY MEDICAL CORPS.

*1st Highland Field Ambulance.*—Captain John W. Milne, M.B., resigns his commission, dated April 30, 1909.

*1st Home Counties Field Ambulance.*—Sidney Wood Milner to be Lieutenant, dated March 29, 1909.

*Sanitary Service.*—Captain William Archibald, M.D., resigns his commission, dated February 28, 1909.

#### *For attachment to Units other than Medical Units.*

Surgeon-Captain John Graham Martin, M.B., from the 2nd Volunteer Battalion, the King's (Liverpool Regiment), to be Captain, with precedence as in the Volunteer Force, dated April 1, 1908.

Surgeon-Captain William Watkin Jones, M.B., from the 3rd Volunteer Battalion, the Welsh Regiment, to be Captain, with precedence as in the Volunteer Force, dated April 1, 1908.

Major David Smart, M.B., from the 1st West Lancashire Field Ambulance, to be Major, dated May 8, 1909.

Surgeon-Captain William Buchan Armstrong, M.B., from the 9th (the Dumbartonshire) Battalion, Princess Louise's (Argyll and Sutherland Highlanders), to be Captain, with precedence from July 11, 1908, dated May 20, 1909.

### ROYAL ARMY MEDICAL CORPS.

*2nd Home Counties Field Ambulance.*—Lieutenant David L. Hamilton, F.R.C.S. Edin., to be Captain, dated April 1, 1909.

*2nd West Lancashire Field Ambulance.*—Walter Linney Hawksley, M.B., to be Lieutenant, dated April 1, 1908.

*2nd London (City of London) Field Ambulance.*—Quartermaster and Honorary Lieutenant Ernest J. Thurgar, from the Unattached List, is appointed Transport Officer, with the honorary rank of Lieutenant, with precedence as from May 5, 1908, dated June 7, 1909.

#### *Attached to Units other than Medical Units.*

Captain Conrad T. Green to be Major, dated September 21, 1908.

Major Kenneth W. I. Mackenzie resigns his commission, and is granted permission to retain his rank and to wear the prescribed uniform, dated April 25, 1909.

Alan Carpmæl Ransford to be Lieutenant, dated February 22, 1909.

William Henry Newton to be Lieutenant, dated March 1, 1909.

### ROYAL ARMY MEDICAL CORPS.

*Lowland Mounted Brigade Field Ambulance.*—The transfer as a Transport Officer with the honorary rank of Lieutenant of Lieutenant Robert Buchanan Carslaw, M.B., Transport Officer, from the Scottish Command, Glasgow Companies, Royal Army Medical Corps (Volunteers), which was announced in the *London Gazette* of July 14, 1908, is cancelled.

Lieutenant Robert Buchanan Carslaw, M.B., Transport Officer from the Scottish Command, Glasgow Companies, Royal Army Medical Corps (Volunteers), to be Lieutenant, with precedence as in the Volunteer Force, dated April 1, 1908.

*3rd Lowland Field Ambulance.*—The undermentioned officers to be Majors:—

Captain Alexander M. McIntosh, M.B., dated April 1, 1909.

Lieutenant David J. Graham, M.D., from the Attached to Units other than Medical Units List, to be Lieutenant, dated July 3, 1908.

*1st Welsh Field Ambulance.*—Thomas Smyth to be Lieutenant, dated May 1, 1909.

*4th Southern General Hospital.*—The undermentioned are appointed officers whose services will be available on mobilisation, dated September 29, 1908:—

To be Lieutenant-Colonels: Henry Davy, M.D.; Edward James Domville; Edward Lawrence Fox, M.D.; James Elliot Square, F.R.C.S. Eng.

To be Majors: John Mortimer, M.B.; Arthur Charles Roper, F.R.C.S.Edin.; Arthur Nathaniel Davis; Walter Ley Woolcombe, F.R.C.S.Edin.; Robert Leonard Rutherford, M.D.; Reginald Horace Lucy, M.B., F.R.C.S.Eng.; William Cheyne Wilson, M.D.; Russell Coombe, M.D., F.R.C.S.Eng.

To be Captains: John Wallis Gill; Charles Edward Bean, F.R.C.S.Edin.; James Henry Dawe, M.B.; George Frederick Aldous, F.R.C.S.Edin.; Reginald Vaughan Solly, M.D., F.R.C.S.Eng.; Henry Andrew; Ernest George Symes Saunders, M.D.; William Crosbie Hamilton, M.B.; Walter Ley Pethybridge, M.D.; Gilbert James Arnold, F.R.C.S.Eng.; George Calrow Sandford, M.D.; Thomas Horton, M.D.; Colin Dunrod Lindsey, M.D.; Brennan Dyball, M.B., F.R.C.S.Eng.; Charles Llewellyn Lander, M.B.; George Augustus Roberts, F.R.C.S.Eng.; Arthur Edmund Carver, M.D.; Ernest George Smith.

*For attachment to Units other than Medical Units.*

Arthur Edward Horsfall, M.B (late Second Lieutenant, 7th Battalion, the Duke of Wellington's (West Riding Regiment), to be Lieutenant, dated March 17, 1909.

Edward Lucius Day Dewdney to be Lieutenant, dated February 13, 1909.

Surgeon-Captain Alexander Paul Swanson, from the 5th (Flintshire) Battalion, the Royal Welsh Fusiliers, to be Captain, with seniority as from May 23, 1900, dated April 27, 1909.

*1st Home Counties Field Ambulance.*—The transfer from the Eastern Command, Maidstone Companies, Royal Army Medical Corps (Volunteers), of Quartermaster and Honorary Lieutenant Bernard Dalby Hobson, which was announced in the *London Gazette* of September 15, 1908, is cancelled.

Quartermaster and Honorary Lieutenant Bernard Dalby Hobson, from the Eastern Command, Maidstone Companies, Royal Army Medical Corps (Volunteers), to be Transport Officer, with the honorary rank of Lieutenant, with precedence as in the Volunteer Force, dated April 1, 1909.

*2nd London (City of London) Field Ambulance.*—Reginald Ernest Bickerton, M.B., to be Lieutenant, dated April 13, 1909.

*3rd London (City of London) Field Ambulance.*—Captain Hubert C. Phillips resigns his commission, dated May 8, 1909.

Bernard Elwell Potter, M.B., to be Lieutenant, dated May 12, 1909.

*6th London Field Ambulance.*—Edward Pigott Minett to be Lieutenant, dated May 18, 1909.

*2nd North Midland Field Ambulance.*—Albert John Riddett to be Lieutenant, dated April 29, 1909.

*3rd North Midland Field Ambulance.*—George James Smith Atkinson to be Lieutenant, dated March 8, 1909.

*2nd South Midland Field Ambulance.*—Samuel George Webb, M.D., to be Lieutenant, dated May 19, 1909.

*2nd Northumbrian Field Ambulance.*—George Reginald Ellis, M.B., to be Lieutenant, dated May 1, 1909.

The undermentioned officers to be Captains, dated May 8, 1909: Lieutenant Henry C. Pearson, M.B.; Lieutenant Duncan A. Cameron, M.B.

*3rd West Riding Field Ambulance.*—Lieutenant James Mackinnon, from the 1st West Riding Field Ambulance, to be Lieutenant, dated April 26, 1909.

*1st Northern General Hospital.*—To be Major, whose services will be available on mobilisation:—

Robert Alfred Bolam, M.D. (late Lieutenant, 9th Battalion, the Durham Light Infantry), with seniority next below Major W. G. Richardson, dated March 30, 1909.

*Sanitary Service.*—To be Captain, whose services will be available on mobilisation: William Butler, M.B., dated June 5, 1909.

*For attachment to Units other than Medical Units.*

Surgeon-Major William B. Mackay, M.D., from the 7th Battalion, the Northumberland Fusiliers, to be Major, with seniority as from August 1, 1903, dated April 1, 1908.

*Attached to Units other than Medical Units.*

Lieutenant James A. Gibson, M.D., resigns his commission, dated April 12, 1909.

*1st South Midland Mounted Brigade Field Ambulance.*—Donald Buchanan to be Lieutenant, dated May 1, 1909.

*1st Home Counties Field Ambulance.*—George Potts to be Lieutenant, dated February 11, 1909.

*1st South Midland Field Ambulance.*—Major Arthur R. Badger resigns his commission, dated June 4, 1909.

*5th Southern General Hospital.*—The undermentioned to be officers whose services will be available on mobilisation, dated July 21, 1908 :—

To be Lieutenant-Colonels: Claude Clarke Claremont, M.D.; Charles Plumley Childe, F.R.C.S.Eng.; Surgeon-Lieutenant-Colonel and Honorary Surgeon-Colonel George Gordon Sparrow (late 2nd Hampshire Royal Garrison Artillery (Volunteers)), (Retired List); Harry Wynter Shettle.

To be Majors: John Robert Stevenson Robertson, M.B. (late Surgeon, Army Medical Department); Arthur Vernon Ford; John Phillips, M.B.; John Rushworth Keele; Norman Elliott Aldridge, M.B.; Charles Frederic Routh, M.D.; William Prior Purvis, M.D., F.R.C.S.Eng.; Howard Percy Ward, M.B.

To be Captains: Thomas Arthur Munro Forde; Samuel Goss; George Hebb Cowen, M.B., F.R.C.S.Eng.; William Patrick McEldowney, M.B.; Charles Archibald Scott Ridout, M.B., F.R.C.S.Eng.; John Temple Leon, M.D.; Harold Burrows, M.B., F.R.C.S.Eng.; John Henry Pearson Fraser, M.B.; John Lister Wright; Edward James Davis Taylor, M.B.; Thomas Holmes, M.D.; John William Gregory Kealy; Samuel Hughes, M.B.; Charles Howard Saunders, M.B.; William Patrick O'Meara; Rolland Atkinson Dove, M.B.; Alfred William Power; John Tiley Montgomery McDougall (late Surgeon, Royal Navy); Charles Lamplough, M.D.; Montague Harold Way.

*For attachment to Units other than Medical Units.*

Surgeon-Captain Philip John Le Riche, from the 2nd Volunteer Battalion, the Royal Sussex Regiment, to be Captain, with precedence as in the Volunteer Force, dated April 1, 1908.

*Attached to Units other than Medical Units.*

Captain Richard J. Swan resigns his commission, dated May 3, 1909.

Lieutenant John E. Simpson, M.B., to be Captain, dated May 11, 1909.

*London Mounted Brigade Field Ambulance.*—Major Martin Alfred Cooke, from the List of officers attached to Units other than Medical Units, to be Major, dated May 21, 1909.

*Notts and Derby Mounted Brigade Field Ambulance.*—Lieutenant Alexander R. Tweedie to be Captain, dated March 27, 1909.

*3rd Home Counties Field Ambulance.*—Tom Devlin to be Transport Officer, with the honorary rank of Lieutenant, dated May 24, 1909.

*2nd Northumbrian Field Ambulance.*—Second Lieutenant Arthur Cecil Hays McCullagh, M.B., from the Unattached List, to be Lieutenant, dated April 1, 1909.

*1st Northern General Hospital.*—Surgeon-Major and Honorary Surgeon-Lieutenant-Colonel John Victor Walton Rutherford, from the 1st Northumbrian Brigade, Royal Field Artillery, to be Lieutenant-Colonel, dated March 30, 1909.

*Attached to Units other than Medical Units.*

Lieutenant Samuel Martyn, M.B., to be Captain, dated April 1, 1908.

*For attachment to Units other than Medical Units.*

Henry Michael Bayer (late Surgeon-Lieutenant, 5th (Irish) Volunteer Battalion, the King's (Liverpool Regiment)) to be Captain, dated May 1, 1909.

Douglas George Rice-Oxley to be Lieutenant, dated May 19, 1909.

Lieutenant-Colonel and Honorary Colonel (Honorary Lieutenant-Colonel in the Army) Sir James Richardson Andrew Clark, Bart., C.B., from the Royal Army Medical Corps (Militia), to be Lieutenant-Colonel with the honorary rank of Colonel, with precedence as in the Militia, dated September 20, 1908.

## VOLUNTEER CORPS.

### ROYAL ARMY MEDICAL CORPS (VOLUNTEERS).

*Scottish Command, Edinburgh Company.*—Quartermaster and Honorary Captain William T. Bashford resigns his commission, and is granted permission to retain his rank and to wear the prescribed uniform, dated March 31, 1908.

### CADET BATTALIONS AND COMPANIES.

*1st Cadet Battalion, the Manchester Regiment.*—Surgeon-Major Israel J. E. Renshaw resigns his commission, dated May 29, 1909.

## NOTES FROM LONDON DISTRICT METROPOLITAN ASYLUMS BOARD.

### THE TERRITORIAL FORCES.

(1) On May 22, 1909, the Board resolved :—

“That the following words be added to the resolution adopted by the Board on February 15, 1908 [see Official Circular, p. 133], under which special leave of absence

is granted to those officers and servants who may be members of the Territorial Force:—

“Provided that the time (not exceeding eight days) which may be spent by any officer or servant in attending the annual training of the Territorial Force shall be regarded as supplementary to the ordinary annual leave when such annual leave does not exceed fourteen days.”

“That it be an instruction to the principal officers of the Board's institutions to afford special facilities for the training (both annual and otherwise) of members of the Board's staff who are members of the Territorial Force, in so far as may be compatible with the proper and efficient performance of their duties to the Board.”

These resolutions were communicated to the heads of the institutions concerned on May 26, 1909.

(2) On May 22, 1909, the Board also resolved:—

“That the nurses in the employment of the Board be granted permission to enrol in the Territorial Nursing Service.”

(3) *Circular letter addressed by the Clerk to the Board to the Heads of the Institutions.*

“May 26, 1909.

“I am directed to inform you that the managers at their meeting on the 22nd instant granted permission to nurses in the employment of the Board to enrol in the Territorial Nursing Service.

“In this connection, I have to inform you that in the circular memorandum issued by the War Office on August 7, 1908, detailing the conditions under which the Army Council had sanctioned the formation of a nursing service for the general hospitals for the Territorial Force, it is provided that the main duties of the local committee in each hospital centre will be to enrol sisters and nurses who are willing to serve in case of invasion, and to revise the roll annually, it being understood that the nurses will not be taken from the hospitals to which they belong unless they have the permission of the hospital authorities, and that only those nurses who are recommended by their matron will be enrolled in the service.”

#### QUEEN ALEXANDRA'S IMPERIAL MILITARY NURSING SERVICE.

*Postings and Transfers.*—Sisters: Miss M. O'C. McCreery, to Military Hospital, Cottonera, Malta, from Military Hospital, Valletta. Staff Nurses: Miss M. A. Wilson Green, to the Alexandra Hospital, Cosham, from the Queen Alexandra Military Hospital, Millbank, London; Miss A. C. W. Teevan, to Military Hospital, Chatham, from Cambridge Hospital, Aldershot; Miss N. R. McNeil, to Cambridge Hospital, Aldershot, from Military Hospital, Chatham; Miss M. H. Graham, to Military Hospital, Colchester, from Cambridge Hospital, Aldershot; Miss K. A. Broade, to Cambridge Hospital, Aldershot, from Military Hospital, Colchester.

*Appointments Confirmed.*—Staff Nurses: Miss E. B. Levay, Miss S. F. Davies, Miss E. C. E. Lindsay, Miss M. Kearney, Miss E. D. Lang, Miss M. A. Roe.

### RESULTS OF EXAMINATION OF MAJORS AND LIEUTENANTS, R.A.M.C.

The following results of examinations are notified for general information:—

Passed in Military Law for the rank of Lieutenant-Colonel: Majors J. D. Ferguson, D.S.O.; C. M. Fleury; W. Tibbits, M.B.; B. W. Longhurst; C. T. Samman; A. W. Hooper, D.S.O.; Captain H. Herrick.

Passed in technical subjects for the rank of Lieutenant-Colonel: Majors O. L. Robinson; G. A. T. Bray; E. H. Condon, M.B.; H. A. Hinge (80 per cent.).

Passed in A.M.O.: E. E. Powell; C. M. Fleury; G. A. Moore, M.D. S. and E.: L. Way; G. S. Mansfield, M.B.; G. A. Moore, M.D.; R. C. Lewis. Med. Hist.: C. M. Fleury; G. S. Mansfield, M.B.; R. C. Lewis.

Passed in (h) i for rank of Captain: R. de V. King; W. K. Blaman; H. G. Gibson; J. C. Hart, M.B.; J. W. L. Scott; G. B. Edwards; F. D. G. Howell; T. W. O. Sexton.

Passed in (h) ii and iii for the rank of Captain: T. S. Blackwell; F. Forrest; C. T. Edmunds; G. H. Stevenson, M.B.; B. Johnson (80 per cent.); G. P. A. Bracken; H. L. Howell; W. F. M. Loughnan; T. W. Browne; T. T. H. Scott, M.B.; A. C. Elliott, M.B.; E. M. Middleton.

Passed in (d) ii for the rank of Captain : J. S. Dunne, F.R.C.S.I. ; T. S. Blackwell ; A. D. O'Carroll, M.B. ; F. Forrest ; C. T. Edmunds (75 per cent.) ; E. W. M. Paine ; F. D. G. Howell ; T. T. H. Robinson, M.B. ; G. H. Stevenson, M.B. ; G. P. A. Bracken ; H. L. Howell ; W. F. M. Loughnan ; T. W. Browne (75 per cent.) ; J. du P. Langrishe, M.B. ; T. H. Scott, M.B. ; A. C. Elliott, M.B. ; F. Casement, M.B. ; E. M. Middleton (75 per cent.) ; (h) ii : W. C. Smales ; W. I. Thompson, M.B. ; J. du P. Langrishe, M.B. (h) iii : T. T. H. Robinson, M.B. ; F. L. Bradish ; J. J. O'Keeffe, M.B. ; F. Casement, M.B.

## ROYAL ARMY MEDICAL COLLEGE.

### EXAMINATION OF CAPTAINS FOR PROMOTION TO MAJOR.

*State Medicine.*—(Practical examination.) First day. Thursday, July 1, 1909. From 10 a.m. to 1 p.m.

(1) Examine the loaf of bread before you and report on its fitness, or otherwise, for the use of patients in hospital, giving your reasons. The determination of the moisture is not required.

(2) The sample of coffee has been sent to you from the canteen for an opinion as to its quality. The report is required as soon as possible so that elaborate procedure is unnecessary.

(3) Prepare to ascertain the total nitrogenous content of the substance given you and leave in the fume chamber.

*State Medicine* (Special Subject).—(Written.) Thursday, July 1, 1909. From 2.30 p.m. to 5.30 p.m.

(1) Describe the various methods of water-filtration on a large scale, and discuss generally the efficacy and relative advantages of these methods and of other methods of filtration of water on a large scale.

(2) Discuss the various methods in use for the purification of water in the field, stating the difficulties and advantages in each case. What method would you recommend to be adopted in the case of :—

(a) A division of infantry on service on the line of march ?

(b) A fortified post on the lines of communication ?

(c) Signalling party of infantry detached from the main body, at some distance, for seventy-two hours ?

(d) A patrol of cavalry on a long-distance reconnaissance ?

Give your reasons for your recommendations in each case.

(3) What is meant by natural ventilation ? Discuss fully the forces which produce it. What are the ordinary forms of inlet and outlet, and what criticisms would you raise with reference to them ? In the case of a large living-room, what form of aperture would you rely on ?

(4) You are in charge of a station, and two cases of cholera are reported from a unit in the garrison in the course of the afternoon of June 15. What recommendations would you make that evening for preventing the spread of the disease ? By 10 a.m. on the 16th four more cases are admitted from the same unit. What further recommendations would you make, there being no cases in any other unit ?

(5) As sanitary officer you are asked to confirm the diagnosis in the above instances. Describe in detail the procedure you would adopt and that required by any further investigations you may think necessary to ascertain the cause of the outbreak.

*Practical State Medicine.*—Second day. Friday, July 2, 1909. From 10 a.m. to 1 p.m.

(1) Finish the estimation of the total nitrogen in the substance which you prepared yesterday. Express as protein per cent.

(2) You are suspicious of the butter supplied to the hospital by the contractor, and have taken the sample before you. Ascertain whether the sample is in accordance with the terms of the specification, which are given you, the water being 15 per cent., and the salt 5 per cent.

*Pathology* (Special Subject).—(Written Examination.) Thursday, July 1, 1909. From 2.30 p.m. to 5.30 p.m.

(1) Give an account of the habitat, structure and life-history of the *Filaria medinensis*.

(2) In a cavalry regiment several of the horses suffer from an epizootic, a feature of which is a lymphadenitis especially of the neck glands, and which in certain cases

is fatal. Some of the men develop a serious illness, in which single or multiple skin lesions occur. State what organisms you would think of as a source of the human and animal illnesses, what light the characters of the skin lesions would throw on the cause of the disease, and detail the steps you would take with a view of establishing a bacteriological diagnosis.

(3) Give an account of the morbid anatomy of "Oriental Sore." State the grounds which exist for supposing it to be due to a *Leishmania*.

(4) A non-fatal case of spinal meningitis occurs with Gram-negative cocci in the lumbar puncture fluid. State what steps you would take for determining whether the causal organism was the meningococcus or the gonococcus. Deal especially with what course you would adopt in the event of your failing to cultivate any organism from the cerebrospinal fluid.

*Pathology*.—Practical Examination. First day. Thursday, July 1, 1909. From 10 a.m. to 1 p.m.

(1) The plate marked with your examination number contains Fawcett's modification of Conradi's medium which was inoculated forty-eight hours ago with an excretion suspected to contain typhoid or para-typhoid bacteria. Make a careful examination of any colonies which appear to you suspicious, and prepare from them sub-cultures with a view to their more accurate differentiation to-morrow.

Leave stained films beside your microscope, and describe in your paper the steps which you have taken and the results which you have so far obtained.

(2) Stain and examine the paraffin section, and describe in your paper the nature and condition of the tissue, and whether you have detected in it any protozoal or bacterial micro-organisms.

Leave your specimens for examination.

(3) Examine the numbered and stained specimens carefully. Describe in your paper what you have seen, and your opinion as to the nature of the specimens.

*Pathology*.—Practical Examination. Second day. Friday, July 2, 1909. From 10 a.m. to 1 p.m.

(1) Examine the sub-cultures which you made from yesterday's plate, and mention in your paper the conclusions which you have reached as to the presence or absence in the original culture of bacilli of the typhoid group, also the cultural and morphological characteristics which have influenced you in arriving at these conclusions.

Leave your culture tubes for examination, and also stained films of the organisms which you have isolated.

(2) Examine the pathological secretion which is marked with your examination number, and write a report upon it, leaving stained films beside your microscope.

(3) Stain the film of malarial blood and write an account of the forms you have seen, and your opinion as to the variety of malaria.

Leave your specimen in focus under your oil-immersion lens.

(4) Oral examination.

*Midwifery and Gynaecology* (Special Subject).—(Written). Friday, July 2, 1909. From 10 a.m. to 1 p.m.

(1) How would you diagnose a case of breech presentation? Describe the management of an uncomplicated case with the sacrum directed posteriorly and to the right.

(2) The os uteri is the size of a florin, and the umbilical cord is prolapsed. Discuss the treatment.

(3) How would you investigate a case of puerperal pyrexia occurring on the fifth day after delivery? Indicate the lines of treatment you would adopt.

(4) Describe the operation of Cæsarean section. Under what circumstances may this operation be required?

(5) Give the clinical history, diagnosis, and treatment of a case of pelvic hæmatocele.

(6) A nulliparous woman, aged 54, after a cessation of the menses for four years, has a return of uterine hæmorrhage. There is some hypogastric pain, and on bimanual examination the uterus is somewhat enlarged. Discuss the diagnosis and treatment of the case.

*Ophthalmology* (Special Subject).—(Written). Friday, July 2, 1909. From 2 p.m. to 5 p.m.

(1) Describe the varieties, pathology, and symptoms of cataract. What treatment—non-operative and operative—may be adopted? (Do not describe details of operations.) Discuss the indications for and against operation.

(2) Enumerate the various lesions of the eye which may occur in tuberculosis. Discuss the treatment, local and general.

(3) Enumerate the causes of unilateral proptosis, and discuss the treatment in the ious conditions.

*Dermatology and Venereal Diseases.*—(Special Subject) —(Written). Friday, July 2, 1909. From 3 p.m. to 5 p.m.

- (1) Give a short account of the various forms of tuberculosis of the skin.
- (2) Give an account of psoriasis, its eruption, anatomy, differential diagnosis and treatment.
- (3) Describe the various forms of erythema multiforme, and state what you know of its causation.
- (4) What are the manifestations of secondary syphilis other than the cutaneous symptoms?

EXAMINATION OF LIEUTENANTS, ROYAL ARMY MEDICAL CORPS AND INDIAN MEDICAL SERVICE, AT THE CLOSE OF THE FIRST SESSION, 1909.

*Hygiene.*—Written Examination. Friday, June 25, 1909. From 10 a.m. to 1 p.m.

- (1) What is the primary source of all water? What are the chief impurities that water takes up between its original source and the point at which it is collected by man for use? Discuss the significance of each in respect of its power of producing disease.
- (2) What do you understand by the word "trap" as applied in sanitary engineering? How would you distinguish between a "good" and a "bad" trap? Describe a few of each kind.
- (3) What is the object of disinfection? Supposing a case of scarlet fever to have occurred in a barrack-room, what process of disinfection would you adopt as regards the man's belongings and surroundings? How would you vary the procedure in the case of a married quarter?
- (4) Define ventilation. How is this effected in an ordinary room? What relation does the cubic space allowed per head bear to the amount of fresh air needed by each man in a room?
- (5) To what is the discomfort in a badly ventilated room due? Describe in detail how you would proceed to estimate the impurities in such a room, and how you would express your results.

*Hygiene.*—Practical Examination. Monday, June 28, 1909. From 2.30 p.m. to 5.30 p.m.

- (1) Examine the sample of beer before you and give the results of your analysis.
- (2) Estimate the acidity of the solution before you and express as percentage of lactic acid.  
Calculate the amount of alkali which would be required to be added to make it + 15 acid per litre.
- (3) Ascertain whether any of the commoner metals are present in the water sample which will be given you.

*Pathology.*—Written Examination. Saturday, June 26, 1909. From 10 a.m. to 1 p.m.

- (1) By what channels may bacteria gain entrance to the system, and upon what factors does their power of inducing disease depend? Illustrate your answer by referring to the following diseases: Plague, Malta fever, and epidemic cerebrospinal meningitis.
- (2) Describe the principal cultural and morphological characters of the *Diplococcus pneumoniae* and its association with croupous pneumonia. Mention any other pathological conditions which have been attributed to this organism.
- (3) How would you make a bacteriological diagnosis in a case of diphtheria? In the event of an outbreak of this disease in a garrison, what steps would you take with a view to checking the spread of the epidemic?
- (4) Give an account of the sexual cycle of development of the parasites of malaria, and describe the gametes of each species of human malaria.

*Pathology.* Practical Examination. Thursday, June 24, 1909. From 10 a.m. to 1 p.m.

- (1) Test the sample of blood-serum, marked with your number, as to its agglutinating power on the typhoid bacillus, using the microscopic method, and testing the following dilutions of the serum, 1—10, 1—20, and 1—50. Prepare your emulsion from the agar cultures provided, and record in your paper the details of your technique, and



the results of your examination; label your specimens and leave them beside your microscope.

(2) Stain the paraffin section of brain tissue by carbol-thionin so as to demonstrate the presence of malarial parasites within the capillaries. Leave your specimen in focus under your oil-immersion lens.

(3) Stain a film of your own blood by the eosin and methylene blue method, and label it for examination.

(4) Oral examination upon specimens displayed under the microscope.

*Military Surgery.*—Thursday June 24, 1909. From 2.30 p.m. to 5.30 p.m.

(1) Describe the "explosive" type of exit wound, and state how it is produced. (10 marks.)

(2) Describe the injuries of large nerves produced by the small-bore bullet, and discuss briefly their diagnosis and treatment. (30 marks.)

(3) What forms of gunshot injury of the knee-joint may be met with? Give briefly the symptoms and treatment of each. (30 marks.)

(4) Give a brief account of gunshot wounds of the neck, with their symptoms and treatment. (30 marks.)

(N.B.—Injuries to the spinal column are not included in this question.)

*Tropical Medicine.*—Saturday, June 26, 1909. From 2.30 p.m. to 5.30 p.m.

(1) Give a short account of a case of kala-azar, and state how you would treat it.

(2) Describe a typical case of Malta fever, and state how you would deal with it in its various stages.

(3) What are the usual causes of anæmia in residents in the Tropics? How would you treat the various forms?

(4) What are the symptoms of ankylostomiasis? How would you treat it?

(5) What is the essential lesion in beri-beri, in what forms may it manifest itself, and with what disease may it be confounded?

(N.B.—The first three questions and either the fourth or fifth to be answered, but not both.)

*Military Medical Administration.*—Friday, June 25, 1909. From 2.30 p.m. to 5.30 p.m.

(1) (a) Of what forces is our army composed? What is the chief point of difference as compared with most foreign armies?

(b) What is the Officers' Training Corps and for what purpose does it exist?

(2) When a soldier reports sick, what entries can be made on the sick report? Explain their meaning.

(3) How would you deal with an insane soldier? State the procedure up to his final disposal.

(4) A soldier is wounded on service. Describe the method of his conveyance to the Base Hospital, enumerating the various institutions he passes through.

(5) What are the respective functions of the Royal Engineers and Army Service Corps in connection with a military hospital?

## ROYAL ARMY MEDICAL COLLEGE.

### DISTRIBUTION OF PRIZES.

THE half-yearly distribution of prizes for Lieutenants of the Royal Army Medical Corps and Indian Medical Service on probation took place in the lecture theatre of the Royal Army Medical College, Grosvenor Road, on Thursday, July 1, at 12.30 p.m. In addition to the Staff of the College, Surgeon-General Branfoot, C.I.E., was also present on behalf of the India Office.

Surgeon-General Gubbins took the chair in the absence of the Director-General, and in opening the proceedings expressed the regret of Sir Alfred Keogh at being unable to preside owing to unavoidable detention in Dublin. He was glad to be in a position to state that the Commandant of the College had reported favourably both on the conduct and uniform good work of the young officers, whilst the competition for the various prizes was both close and keen.

He would now call on Colonel Wardrop to read out the list of prize-winners, and at the same time introduce Sir Frederick Treves, who had very kindly promised to present the prizes.

The following is the list of prize-winners :—

Lieutenant H. S. Ranken, R.A.M.C.	..	..	Herbert Prize.
" " " "	..	..	De Chaumont Prize.
" " " "	..	..	Tulloch Memorial Prize.
" " " "	..	..	Ranald Martin Prize.
" " " "	..	..	Marshall Webb Prize.
" J. A. Manifold	..	..	First Montefiore Prize.
" C. L. Franklin	..	..	Second Montefiore Prize.
" A. M. Jukes, I.M.S.	..	..	Parkes Memorial Prize.
" B. Gale, I.M.S.	..	..	Fayrer Memorial Prize.

The class consisted of twenty-seven Lieutenants on probation for the R.A.M.C., and also of eleven for the I.M.S.

At the conclusion of the presentation Sir Frederick Treves addressed the class as follows :—

Surgeon-General Gubbins and Gentlemen,—I must, in the first place, congratulate all those who have taken prizes on this occasion, and express the hope that the event of this day may be a forecast for the future of their careers. Further, I must congratulate all present on the fact that they have joined one of the finest services open to medical men, for it is no exaggeration to say that the Army Medical Service has no equal in any country. You must have observed that recently the combatant services have been exposed to a good deal of criticism. Practically every branch of the Army and Navy has been attacked, but it is well to note that no attack whatever has been made upon the Army Medical Service. Another thing, gentlemen, that you must be congratulated upon : you enter the service at a very auspicious moment. You know perhaps, that the Army Medical Department has passed through a period of low water ; you enter it on the crest of the flood tide, and on that tide you will be carried to what, I hope, will be fortune. There are certain points connected with the service which are worthy of mention, because they crop up when the value of the service is criticised. The first is a humble one—the question of the pecuniary advantages of the Army Medical Service. It is often said that the pay is small. Well, I do not hesitate to say that there is no branch of the service better paid than the Army Medical Service. I must remind you that the profession of medicine is financially a poor one. For every one who conspicuously succeeds there are fifty who fail. The average net income of the medical profession is low. If you will compare the financial position of a young officer of the Royal Army Medical Corps with that of an average practitioner of the same age, I think you will own that the advantage is with the officer. To the officer's pay must be added house rent and travelling expenses, and, above all, the premium of a very liberal insurance. A general practitioner starting in practice has heavy expenses ; he may be overtaken by ill-health or ill-fortune, and be thereby reduced to poverty. The officer of the Army Medical Service is liberally insured against the consequences of all illness, and is not burdened with financial responsibilities or involved in financial risks. The life, too, of a general practitioner is often hard and unenjoyable. How many general practitioners do you know of in your own circle who, at the end of a practice extending over eighteen to twenty years can retire on £365 a year ?

In the next place I cannot imagine a career that should appeal to the young medical man more keenly than a career in one or other of these services. There is the element of enterprise, possibly of adventure, the element of variety : the opportunity of seeing every part of the Great British Empire, the association with an army of great traditions. It is noteworthy that at this moment the current of research in medicine is passing in a direction which brings it much in touch with your two services. Enquiry is being keenly directed to the study of infective diseases and to the general treatment of the same, and it is needless to say that in such an investigation tropical diseases occupy the most prominent place. It is to the officers of the medical services that the fullest opportunities are afforded of taking an active part in this enquiry.

Again, as regards sanitation, there are no conditions under which sanitary problems can be studied more favourably than those which are afforded by the Army Medical Service or the Indian Medical Service. The opportunity these services afford of advancing and elaborating sanitary science is not only great, it is unique. Since it has been realised that in a campaign more men die of disease than of gunshot wounds the position of the Army Medical Service in the British Army has become a greater and more conspicuous force. These two services offer great opportunities for scientific distinction. So long as the history of medicine remains, the names of Ross, Bruce and Leishman will never die. The well-deserved honour recently conferred upon

Lieutenant-Colonel Leishman is one that is keenly appreciated throughout the whole medical profession; I only mention these names, but they by no means exhaust the list of eminent scientists the services have produced. The percentage of men who have made themselves distinguished in the science of medicine is higher in the two medical services here represented than it is in the civil profession; or, to put it in another way, the Army Medical Officer has a greater prospect of attaining distinction in science than has the civilian practitioner.

Before the South African War the civil profession knew little of the military service, but now, largely through the efforts of the Director-General, the civil profession and the Army Medical Service are working hand in hand.

In conclusion, remember that you are entrusted with a great charge—the health of the British Army and the Army in India. Remember that in your hands rests the reputation—both social and professional—of the services to which you belong. It rests with you to maintain that reputation and to raise it. Do not excuse yourselves by saying that you are only at the foot of the latter; for the world still believes in the proverb “*ex pede Herculem*.”

Colonel Wardrop having proposed and Lieutenant-Colonel Melville having seconded a vote of thanks to Sir Frederick Treves, the proceedings terminated.

## ROYAL ARMY MEDICAL CORPS' FUND.

PROCEEDINGS of a Committee Meeting held at the War Office on July 15, 1909.

*Present.*

Surgeon-General Sir Alfred Keogh, K.C.B., in the Chair.

Surgeon-General W. L. Gubbins, C.B., M.V.O.

Colonel D. Wardrop.

Major C. G. Spencer.

Major A. Bruce.

(1) The minutes of the last Meeting were read and confirmed.

(2) It was noted that the following grants have been received from Companies for the quarter ending June 30, 1909:—

	£	s.	d.
Aldershot .. .. .	100	0	0
No. 10 Company, Chatham .. .. .	3	0	0
„ 12 „ Woolwich .. .. .	2	10	0
„ 14 „ Dublin .. .. .	7	10	0
„ 22 „ Cape Town .. .. .	5	0	0
„ 23 „ Pretoria .. .. .	20	0	0
„ 24 „ Bloemfontein .. .. .	20	0	0
„ 31 „ Mauritius .. .. .	3	0	0
Detachment, Middelburg, C.C. .. .. .	7	10	0
„ Potchefstroom .. .. .	10	0	0
„ Harrismith .. .. .	5	0	0
R.A.M.C. Branch .. .. .	5	5	0
R.A.T.A.F., Aldershot .. .. .			

(3) The grants made from the General Relief Fund for the quarter ending June 30, 1909, were approved, and a list of the recipients is appended to these proceedings.

(4) The Aldershot Band accounts were approved and are attached to these proceedings.

A grant of £55 was made towards the current quarter's expenses.

(5) The half-yearly accounts for the R.A.M.C. Fund, having been audited, were examined and passed, and are attached hereto.

(6) An application from the London Soldiers' Home for a grant was considered and discussed. It was resolved to postpone the question until the next meeting; in the meantime the Secretary was requested to visit the Home and ascertain the number of men of the Corps who took advantage of it.

(7) It was resolved to make an annual grant from the School Fund to the Homes for Destitute Catholic Children of £4 each towards the expenses of the three children of Mrs. Waters until they reach the prescribed age, and that no further relief is to be given to Mrs. Waters from the Fund.

(8) The admittance of the child Ivy Dorothy Hart to the Royal Soldiers' Daughters' Home was approved.

(9) Surgeon-General Gubbins, C.B., proposed and Major Spencer seconded a resolution, which was carried, that a sum not exceeding £20 be voted towards erecting a brass tablet in the Chapel at the College to the memory of the late Captain Hardy, who died of sleeping sickness, and that the Memorial Sub-Committee be requested to take steps accordingly; and also to have the Wolseley Memorial Brass removed to the Chapel.

(10) It was reported that the statue of the late Sir James McGrigor has been successfully removed from Chelsea to the College grounds.

(11) It was decided to purchase an engraving of Mr. Vereker Hamilton's picture, "The 92nd Highlanders at Kandahar," at a cost of £4 4s., for the smoking-room at the College.

(12) It was resolved to complete the series of D.-G.'s portraits by having a portrait of the late Sir Andrew Smith, who was Director-General during the Crimean War, painted, at a cost of fifty guineas, from the existing copy now in the R.A.M.C. Mess.

(13) It was noted that the portrait of Sir John Pringle has been completed at a cost of thirty guineas.

(14) A letter was read from Lieutenant-Colonel H. O. Trevor, S.M.O. at Jamaica, stating that there was no headstone to the grave of the late Quartermaster-Sergeant J. A. Sykes, who perished during the recent earthquake there. It was resolved that an estimate be obtained for erecting a suitable stone, and a sum not exceeding £5 was voted for the purpose.

(15) The question as to whether an engraving of Dr. Bryden should be obtained was referred to the Memorial Sub-Committee.

#### ROYAL ARMY MEDICAL CORPS FUND.

RECIPIENTS OF GENERAL RELIEF FOR THE QUARTER ENDING JUNE 30, 1909.

No.	Name	Age	District	Grant	Total	Particulars
124	Mr. J. McE. ..	55	Dublin ..	£3	£3	Destitute and in ill-health.
125	Mr. J. F. ..	47	London ..	£1	£1	Destitute and out of work.
127	Mr. W. C. D. ..	38	Aldershot..	£2	£2	Out of work.
128	Mr. N. J. H. ..	25	London ..	10s.	10s.	Out of work and destitute.
129	Mr. F. H. ..	37	" ..	10s.	10s.	" " " "
130	Mrs. L. E. S. ..	63	Portsmouth	£4	£4	Unable to work through ill-health.
131	Mr. A. D. ..	42	" ..	£2	£2	Destitute and out of employment.
132	Mr. W. H. E. ..	46	London ..	£1	£1	Out of work. Wife delicate.
133	Mr. F. L. ..	38	" ..	10s.	10s.	Destitute and out of work.
134	Mrs. G. H. ..	39	Colchester	£4	£4	Two children to support.
135	Mr. J. D. ..	22	London ..	10s.	10s.	To enable him to take up employment.
136	Mr. T. R. ..	28	" ..	£4	£4	Is unable to work through ill-health.
137	Mrs. S. McC. ..	33	Dublin ..	£4	£4	Lately a widow with three small children.
138	Mr. J. B. ..	39	London ..	£1	£1	Destitute and out of work.
139	Mr. A. W. ..	34	Aldershot..	5s.	5s.	Destitute.
140	Mrs. A. L. ..	50	Belfast ..	£3	£3	Unable to support herself, owing to defective eyesight.
141	Mr. W. A. N. ..	46	Woolwich..	£4	£4	Suffers from multiple sclerosis.
142	Mrs. E. A. C. ..	42	Western ..	£1	£1	Wants assistance until she gets employment.

# ROYAL ARMY MEDICAL CORPS BAND FUND.

## BALANCE SHEET FOR THE QUARTER ENDING JUNE 30, 1909.

RECEIPTS.		EXPENDITURE.	
	£ s. d.		£ s. d.
Expenses and Fees Playing at Millbank ..	.. 9 3 0	Balance, Dr. ..	.. 5 10 9
Officers' Subscriptions (Aldershot) ..	.. 22 2 6	Bandmaster's Salary ..	.. 30 0 0
Grant from R.A.M.C. Fund ..	.. 85 0 0	Band Pay ..	.. 35 4 6
Officers' Separate Subscriptions ..	.. 12 5 0	Sundries (Band Cards) ..	.. 0 14 0
Balance, Dr. ..	.. 1 16 3	Advanced for Railway Fares..	.. 24 1 0
		Hawkes, for Music ..	.. 12 9 4
		Boosey and Son (new bassoon)	.. 18 15 6
		Altering Tunics ..	.. 3 11 8
			<u>£130 6 9</u>

ESTIMATE FOR THE QUARTER ENDING SEPTEMBER 30, 1909.	
Estimated expenditure ..	£93 7 9
Estimated receipts ..	39 1 1
Grants required ..	55 0 0

ACCOUNTS FOR THE HALF-YEAR ENDING JUNE 30, 1909.

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# GENERAL RELIEF FUND.

RECEIPTS.		£ s. d.	EXPENDITURE.		£ s. d.
Balance in hand, December 30, 1908	..	372 19 9	Union Jack Club	..	25 4 0
By Grants—			Corps of Commissioners	..	10 0 0
From Companies	..	247 10 0	Association for Employment R. and D. Soldiers	..	5 0 0
" Subscriptions	..	6 1 0	S. and S. Help Association..	..	5 0 0
Dividends—			Drummond Institute	..	5 0 0
Canadian Stock	..	£10 1 6	Grants to P.M.O., London	..	32 10 0
E. Indian Railways	..	8 6 4	Dublin	..	16 0 0
Refunds	..	18 7 10	Aldershot	..	17 10 0
		5 2 0	Northern	..	2 0 0
			Belfast	..	6 0 0
			Western	..	1 0 0
			Eastern	..	4 0 0
			Portsmouth	..	12 0 0
			Colchester	..	4 0 0
			Woolwich	..	4 0 0
			Bankers' Charges	..	0 0 4
			Balance in hand, June 30, 1909	..	500 16 3
		<u>£650 0 7.</u>			<u>£650 0 7</u>

## INVESTMENTS.

Canada 3½ % Stock	..	£609 6 9
E. India Railway 3½ % Debenture Stock	..	485 0 0



[illegible][illegible]

St. George's Barracks,  
 July 2, 1909.

Examined and found correct.

Signed { E. N. WILSON, Lieutenant-Colonel, R.P.  
 A. A. SUTTON, Lieutenant-Colonel, R.A.M.C.



TRADING ACCOUNTS FROM JULY 1, 1908, TO JUNE 30, 1909.

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# BALANCE SHEET.

FROM JULY 1, 1908, TO JUNE 30, 1909.

LIABILITIES.		£	s.	d.	ASSETS.		£	s.	d.	£	s.	d.
Publishers' Bill for Quarter ending June 30, 1909	..	326	19	9	Balance at Bank on July 1, 1909—	..	27	5	0			
Balance Credit	..	1,612	9	11	Current Account	..	300	0	0			
	..				Deposit	..	117	10	0			
	..				Balance Profit on Year's Working..	..	694	16	0			
	..				National War Loan Bonds..	..	684	6	0			
	..				India Stock	..				1,823	17	0
	..											
	..				This Balance is held as follows—							
	..				National War Loan Bonds	£694	16	0				
	..				India Stock	..	684	6	0			
	..				Deposit Account	..	300	0	0			
	..				Current Account at Bank							
	..				on July 1, 1909..	..	144	15	0			
	..											
	..						£1,823	17	0			
	..				Credit Business Manager's Contingent Account (Stamps)					0	2	5
	..				Furniture	..	49	2	9			
	..				" Sold during Year	..	5	6	6			
	..									43	16	3
	..				Less 10 per cent. fair wear and tear	..				4	7	8
	..											
	..				Subscriptions not paid on July 1, 1909	..				39	8	7
	..				Reprints not paid on July 1, 1909	..				12	0	0
	..				Advertisements for Quarter ending June 30, 1909	..				6	7	11
	..									57	13	9
	..											
	..									£1,939	9	8

July 14, 1909.  
H. J. M. BUIST, Major, R.A.M.C.,  
Hon. Business Manager, Journal of the R.A.M.C.

Examined and found correct.  
Signed { D. WARDROP.  
{ ANDREW CLARK.

## ARMY MEDICAL OFFICERS' BENEVOLENT SOCIETY.

PROCEEDINGS of a Committee Meeting held at the War Office on July 15, 1909.

*Present.*

Surgeon-General Sir Alfred Keogh, K.C.B., K.H.P., Chairman, in the chair.  
Colonel J. Lane Notter.  
Colonel D. Wardrop, C.V.O.  
Major C. G. Spencer.

- (1) The Minutes of the last meeting were read and confirmed.
- (2) The following special urgent grants made by the Secretary were approved:—
 

Orphan daughter of Surgeon J. M. . . . .	£3.
Inspector-General T. B. . . . .	£3.
- (3) It was resolved to give the following grants:—
 

Orphan daughter of Surgeon T. M. . . . .	£5.
J. W. C. . . . .	£30.
son of Assistant-Surgeon H. . . . .	£30.
- (4) The Committee considered the resolution passed at the last General Meeting as to the necessity of amending Rule 8, and was of opinion that Rule 8 is sufficiently explicit as it now stands, and does not require amending.
- (5) It was noted that a cheque for £5 had been received from the Executors of the late Colonel J. Wilson, being a legacy free of duty left by that officer to the Society.
- (6) It was resolved that Majors Spencer and Birrell and the Secretary be appointed to decide as to what old correspondence now in the Office might be destroyed.

F. W. H. DAVIE HARRIS, *Lieutenant-Colonel,*  
*Secretary.*

July 15, 1909.

## THE ARMY MEDICAL OFFICERS' WIDOWS' AND ORPHANS' FUND, INSTITUTED JANUARY 1816.

*President.*—Surgeon-General Sir A. Keogh, K.C.B., M.D., K.H.P., Director-General.  
*Vice-Presidents.*—Deputy Surgeon-General C. A. Innes, M.D.; Deputy Surgeon-General W. G. Don, M.D.

*Trustees.*—Lieutenant-Colonel J. Martin; Lieutenant-Colonel J. Stevenson, M.D.; Deputy Surgeon-General C. A. Innes, M.D.

*Committee for 1909-10.*—Surgeon-General Sir W. D. Wilson, K.C.M.G.; Lieutenant-Colonel W. Grant Macpherson, M.D., C.M.G.; Lieutenant-Colonel A. M. Davies; Lieutenant-Colonel M. W. Russell; Surgeon-General W. S. M. Price; Colonel J. Lane Notter, M.D.; Major E. L. McSheehy, M.D.; Lieutenant-Colonel A. F. S. Clarke, M.D.; Major W. H. Horrocks, M.B.

*Auditors.*—Messrs. Deloitte, Plender, Griffiths and Co., Chartered Accountants.

*Consulting Actuary.*—H. W. Andras, Esq., F.I.A.

*Honorary Treasurer.*—Sir James R. D. McGrigor, Bart.

*Bankers.*—Sir C. R. McGrigor, Bart., and Co., 25, Charles Street, St. James's Square (to whom all subscriptions should be paid).

*Secretary.*—Captain J. T. Clapham, 20, Belgrave Road, Westminster.

Attention is invited to the benefits offered by the above Society, which have been much improved by the amendment of the rules in 1906. It is hoped that officers considering the question of life assurance will investigate the strong financial condition of the Fund, and compare its terms with those offered by other Societies. In so doing it must be borne in mind that *these terms cover all war and climate risks.*

Under the new rules the widow's annuity of £50 is continued after her death to her child, or children, until the youngest surviving child shall have attained the age of twenty-one years. Further, should the wife of a member predecease him, it is optional for him to continue the subscription which he has been paying, to provide for her children up to the age of twenty-one, in the event of his death. A new scale of subscriptions has been brought into force, of which some examples are given below. Some difference in age between husband and wife is here assumed, but as the disparity

in age is less the rate of subscription is proportionately lowered. Where the wife is the elder it is still further decreased.

Husband's age, 25 ..	Wife's age, 25 ..	Ann. Subs., £12 6 5
" " 27 ..	" " 27 ..	" " 12 14 1
" " 30 ..	" " 28 ..	" " 14 1 5
" " 32 ..	" " 29 ..	" " 14 19 7
" " 35 ..	" " 30 ..	" " 16 14 5
" " 37 ..	" " 32 ..	" " 17 10 9
" " 40 ..	" " 35 ..	" " 18 17 7
" " 45 ..	" " 40 ..	" " 21 8 6

There is a class of unmarried members who pay £2 a year. They are allowed the equivalent of the total of their subscriptions, at compound interest, by way of reduction of their annual subscription when becoming married members. There are no marriage fines for members joining under the new rules.

At the last quinquennial valuation of the assets and liabilities of the Fund, as at December 31, 1905, the Actuary reported that "the financial position of the Society was eminently satisfactory"; there being a net surplus of £64,390 after providing for annuities, immediate and contingent, to all widows of members.

The funds of the Society at that date amounted to £125,419. On December 31, 1908, their total value was £131,279; of this sum £89,335 is invested with the Commissioners for the Reduction of the National Debt at a rate of £3 16s. 0½d. per cent. per annum.

At the end of the year 1908 there were 126 members, of whom 14 were unmarried.

A copy of the Rules, the latest Annual Report, and other particulars can be obtained from the Secretary, Captain J. T. Clapham, 20, Belgrave Road, Westminster.

## ARMY AND NAVY MALE NURSES' CO-OPERATION.

THE Hon. Secretary has received the following donation to the funds of the Co-operation :—

Major W. Tibbits, R.A.M.C. .. .. . £0 10 6

## DEATHS.

HODDER.—On June 25, 1909, at Jersey, Colonel Frederic William Lloyd Hodder, M.B., A.M.S., aged 66. He entered the Service March 31, 1866; became Surgeon A.M. Dept., March 1, 1873; Surgeon-Major, March 31, 1878; Lieutenant-Colonel, March 31, 1886; Retired Pay with honorary rank of Brigade-Surgeon, October 1, 1887. Colonel on Retired List, October 18, 1902. His war services were as follows: South African War, 1899-1901. Despatches, *London Gazette*, February 8, 1901. Queen's Medal with clasp. Promoted Colonel.

SCOTT.—At 48, Fountainhall Road, Aberdeen, on June 28, Henrietta Gordon, the beloved wife of Lieutenant-Colonel George Scott, M.B., C.M., D.P.H., late R.A.M.C. Indian and Jamaican papers please copy.

## EXCHANGES, &c.

*The charge for inserting Notices respecting Exchanges in the Royal Army Medical Corps is 5/- for not more than five lines, which should be forwarded by Cheque or P.O.O., with the notice, to Messrs. G. STREET and CO., Ltd., 8, Serle Street, London, W.C., not later than the 22nd of the month.*

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	16	0 12 0	0 5 3				
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	8	0 9 0	0 4 4				
	16	0 16 9	0 6 9				
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	8	0 13 6	0 6 0				
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## Notices.

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### EDITORIAL NOTICES.

The Editor will be glad to receive original communications upon professional subjects, travel, and personal experiences, &c. He will also be glad to receive items of news and information regarding matters of interest to the Corps from the various garrisons, districts, and commands at home and abroad.

**All such Communications or Articles accepted and published in the "Journal of the Royal Army Medical Corps" will (unless the Author notified at the time of submission that he reserves the copyright of the Article to himself) become the property of the Library and Journal Committee, who will exercise full copyright powers concerning such Articles.**

Matter intended for the Corps News should reach the Editor not later than the 15th of each month for the following month's issue. Notices of Births, Marriages, and Deaths are inserted free of charge to subscribers and members of the Corps. All these communications should be written upon one side of the paper only; they should by preference be type-written, but, if not, all proper names should be written in capital letters (or printed) to avoid mistakes, and be addressed The Editor, "JOURNAL OF THE ROYAL ARMY MEDICAL CORPS," War Office, Whitehall, London, S.W.

Communications have been received from Lieutenant-Colonel W. G. Macpherson, Lieutenant-Colonel R. J. S. Simpson, Major W. W. O. Beveridge, Captain R. G. Anderson, Lieutenant-Colonel C. E. Nichol, Captain C. D. Myles, Captain J. C. Kennedy, Lieutenant-Colonel H. S. McGill, Lieutenant-Colonel M. W. O'Keefe, Captain E. G. R. Lithgow, Lieutenant-Colonel J. P. H. Boileau (Rtd.), Captain N. E. Harding.

The following publications have been received:—

*British: The Transvaal Medical Journal, Medical Press and Circular, The Royal Engineers' Journal, Journal of the Royal Sanitary Institute, On the March, The Quarterly Journal of Medicine, The Practitioner, Proceedings of the Royal Society of Medicine, The Hospital, St. Bartholomew's Hospital Journal, Army and Navy Gazette, The Medical Review, Uganda Notes, Red Cross and Ambulance News, Public Health, The Indian Medical Gazette, Transactions of the Society of Tropical Medicine and Hygiene, The Lancet, The British Medical Journal, The St. Thomas's Hospital Gazette, Journal of the Royal Institute of Public Health, Guy's Hospital Gazette, The All-India Hospital Assistants' Journal, Sleeping Sickness Bureau, The Antelope, The Cavalry Journal, Journal of the Royal United Service Institution, The Middlesex Hospital Journal, Travel and Exploration, The Australasian Medical Gazette.*

*Foreign: The Philippine Journal of Science, Annales d'Electrobiologie et de Radiologie, The Bureau de Science, Der Militärarzt, Le Caducée, U.S. Department of Agriculture, Tidskrift I Militär Hälsovård, Federated Malay States, Archiv für Schiffs- und Tropen-Hygiene, Revista de Sanidad Militar y La Medicina Militar Española, Deutsche Militärärztliche Zeitschrift, Archives de Médecine Navale, Archives de Médecine et de Pharmacie Militaires (Nos. 1, 2, 3, 4, 5, 6, 7), Société de Médecine Militaire Française, The Military Surgeon, Bulletin of the Johns Hopkins Hospital, American Medicine, Annales d'Hygiène et de Médecine Coloniales (6 numbers), Russian Medical Journal.*

## MANAGER'S NOTICES.

The **JOURNAL OF THE ROYAL ARMY MEDICAL CORPS** is published monthly, six months constituting one volume, a volume commencing on 1st July and 1st January of each year.

The Annual Subscription is £1 (which includes postage), and should commence either on 1st July or 1st January; but if a subscriber wishes to commence at any other month he may do so by paying for the odd months between 1st July and 1st January at the rate of 1s. 8d. (one shilling and eightpence) per copy. (All subscriptions are payable in advance.)

Single copies can be obtained at the rate of 2s. per copy.

The Corps News is also issued separately from the Journal, and can be subscribed for at the rate of 2s. (two shillings) per annum, including postage. Subscriptions should commence from 1st July each year; but if intending subscribers wish to commence from any other month, they may do so by paying for the odd months at the rate of 2d. per copy. (All subscriptions are payable in advance.)

**Officers of the Royal Army Medical Corps possessing Diplomas in Public Health, &c., are kindly requested to register their special qualifications at Headquarters. Letters of complaint are frequently received from officers stating that their special qualifications have not been shown in the Distribution List which is published as a supplement to the Journal in January and July of each year. As, however, the particulars of this list are supplied from official sources, officers are reminded that unless the possession of Diplomas, &c., has been registered at Headquarters, no entry of such qualifications can be recorded in the Distribution List.**

**Letters regarding non-delivery of the Journal, or change of address, should be sent to the Hon. Manager, "Journal of the Royal Army Medical Corps," War Office, Whitehall, London, S.W., and reach there not later than the 20th of each month.**

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THE HON. MANAGER,

"JOURNAL OF THE ROYAL ARMY MEDICAL CORPS,"

WAR OFFICE, WHITEHALL, S.W.

# JOURNAL

OF THE

## ROYAL ARMY MEDICAL CORPS.

### Corps News.

SEPTEMBER, 1909.

#### ARMY MEDICAL SERVICE.

Surgeon-General William L. Gubbins, C.B., M.V.O., M.B., Deputy Director-General, to be retained on the Active List.

#### ROYAL ARMY MEDICAL CORPS.

Lieutenant-Colonel George F. Weston retires on retired pay, dated July 17, 1909. He entered the Service July 30, 1881; became Surgeon-Major Army Medical Staff, July 30, 1893; Lieutenant-Colonel Royal Army Medical Corps, July 30, 1901. His war services are as follows: Egyptian Expedition, 1887; medal, bronze star. Bechuana-land Expedition, 1884-5. South African War, 1902; operations in Cape Colony, April, 1902; operations in Orange River Colony, April to May 31, 1902. Queen's medal with three clasps.

Lieutenant-Colonel William B. Day, M.B., from the Half Pay List, is restored to the establishment with precedence next below P. C. H. Gordon, dated July 1, 1909.

The undermentioned Lieutenants to be Captains, dated March 1, 1909: James S. Dunne; Arthur D. O Carroll, M.B.

Lieutenant Gilbert G. Collet, M.B., from the Seconded List, is restored to the establishment, dated July 17, 1909.

Captain Travis C. Lucas is seconded for service on the Staff of the Governor of Bombay, dated August 1, 1908.

Major Charles W. Duggan, M.B., retires on retired pay, dated July 28, 1909. He entered the Service July 28, 1891; was promoted Major Royal Army Medical Corps, July 28, 1903. His war service is as follows: West Coast of Africa, 1893; operations against the Sofas. Medal with clasp.

The undermentioned Captains to be Majors, dated July 23, 1909: Charles H. Hopkins; Arthur W. N. Bowen; William H. S. Nickerson, V.C., M.B.; Hubert O. B. Browne-Mason; Frederick S. Penny, M.B.

Lieutenant-Colonel Samuel F. Freyer, C.M.G., M.D., retires on retired pay, dated August 4, 1909. He entered the Service August 2, 1884; became Surgeon-Major Army Medical Staff, August 2, 1896; Lieutenant-Colonel Royal Army Medical Corps, August 2, 1904. His war services are as follows: Soudan Expedition, 1885; Suakin. Medal with clasp; bronze star. Burmese Expedition, 1886-7. Medal with clasp. South African War, 1899-1902. Relief of Ladysmith; Despatches, *London Gazette*, February 8 and April 16, 1901. Queen's medal with clasp; King's medal with three clasps. C.M.G.

Lieutenant Harry R. Edwards, from the Seconded List, is restored to the establish-ment, dated July 30, 1909.

#### THE UNDERMENTIONED LIEUTENANTS TO BE CONFIRMED IN THAT RANK:—

Spencer G. Walker, M.B.; James A. Clark, M.B.; Harold H. Leeson; William G. Wright, M.B.; Albert T. J. McCreery, M.B.; Harry S. Ranken, M.B.; John A. Manifold, M.B.; Samuel S. Dykes, M.B.; Robert G. Priest, M.B.; Percy S. Tomlin-son; Alexander D. Sterling, M.B.; George P. Taylor, M.B.; Robert C. Paris; Alfred



W. Bevis; Ernest C. Lambkin, M.B.; Oswald W. McSheehy, M.B.; Maurice J. Williamson, M.B.; Charles L. Franklin, M.B.; Michael White, M.B.; James J. D. Roche, M.B.; James R. Hill, M.B.; Herbert F. Joynt, M.B.; Alexander S. M. Winder, M.B.; James R. Yourell, M.B.; Philip G. M. Elvery; John Beckton; William B. Rennie, M.B.

Quartermaster and Honorary Captain Charles Crawley, R.A.M.C., is granted the honorary rank of Major, dated August 8, 1909.

**POSTINGS.**—Captain F. P. Lauder to Southern Command.

**APPOINTMENTS.**—Major T. P. Jones, Registrar, Royal Herbert Hospital, Woolwich; Major E. C. Hayes, Sanitary Officer, Southern Command; Captain E. E. Parkes, Specialist in Ophthalmology at Netley; Captain H. A. Bransbury, Specialist in Dermatology at Woolwich; Captain D. Harvey, appointed Honorary Surgeon on the personal staff of His Excellency the Viceroy of India.

**TRANSFERS.**—Major T. P. Jones, from London District to Eastern Command; Captain E. E. Parkes, from Eastern to Southern Command; Captain C. H. Straton, London District to Eastern Command.

**DIPLOMA.**—Captain C. D. Myles has obtained the Diploma in Public Health, Trinity College, Dublin.

**QUALIFICATION.**—Captain E. G. Ffrench has obtained the F.R.C.S. Edin., 1909.

**EXCHANGES.**—Lieutenant Colonel A. L. F. Bate and Major J. H. E. Austin; Lieutenant-Colonel W. C. Beevor and Major W. A. Ward; Captain H. Rogers and M. J. Foulds; Captain H. G. Pinches and S. B. Smith.

**ARRIVALS HOME ON LEAVE.**—From India: Colonel S. C. B. Robinson; Lieutenant Colonels C. T. Edmunds and A. Kennedy; Captains T. S. Blackwell and F. M. M. Ommanney. From Egypt: Captains J. M. B. Rahilly and G. A. D. Harvey. From Malta: Colonel J. G. MacNeece and Captain R. G. Meredith. From Gibraltar: Major H. A. L. Howell and Captain J. Weston. From Bermuda: Captain H. H. A. Emerson. From Jamaica: Major R. W. H. Jackson.

#### EMBARKATION FOR SERVICE ABROAD.

The following are the probable dates on which officers will embark for service abroad. These dates will be adhered to as far as Service exigencies permit:—

##### NORTHERN ARMY, INDIA.

Lieut.-Col. W. G. Macpherson,	Captain F. J. Palmer ..	Jan. 5.
C.M.G. ..	R. A. Cunningham ..	Oct. 7.
R. H. Firth ..	E. G. Ford ..	Dec. 1.
A. Dodd ..	R. F. Ellery (by Ex-	
S. R. Wills ..	change) ..	Nov. 12.
W. B. Day ..	L. M. Purser (by Ex-	
H. Carr (by Ex-	change) ..	Jan. 5.
change) ..	Lieutenant W. R. Galwey ..	Sept. 16.
J. S. Davidson ..	A. Fortescue ..	" "
J. V. Salvage ..	F. H. M. Chapman ..	" "
T. H. F. Clarkson ..	A. Shepherd ..	Feb. 2.
Major W. C. Poole (by Ex-	F. J. Stuart ..	" "
change) ..	J. B. Hanafin ..	" "
J. Ritchie ..	J. A. Renshaw ..	Sept. 16.
E. M. Hassard ..	R. de V. King ..	" 30.
J. Thomson ..	R. G. S. Gregg ..	" 16.
E. E. Powell ..	H. W. Carson ..	" 30.
J. D. Alexander ..	F. T. Dowling ..	" "
H. A. Bray ..	C. P. O'Brien Butler ..	" "
R. F. E. Austin ..	J. F. Grant ..	" 16.
L. F. Smith ..	A. L. Foster ..	Feb. 2.
Captain C. W. Mainprize ..	T. S. Eves ..	" "
N. J. C. Rutherford ..	G. Petit (by Ex-	
	change) ..	" "

## SOUTHERN ARMY, INDIA.

Lieut.-Col. C. E. Nichol, D.S.O.	Nov. 12.	Lieutenant W. G. Avis	.. Sept. 16.
„ A. T. I. Lilly	.. Oct. 7.	„ H. Gibson	.. Feb. 2.
„ G. G. Adams	.. Jan. 14.	„ C. A. T. Conyngham	.. „ „
„ H. E. Cree	.. Feb. 2.	„ D. B. McGrigor	.. Sept. 16.
„ R. H. Penton, D.S.O.	Dec. 11.	„ W. A. Spong	.. „ 30.
Major C. R. Elliott	.. Sept. 16.	„ H. P. Hart	.. „ „
„ O. L. Robinson (by Exchange)	.. Nov. 12.	„ R. F. O. T. Dickinson	.. „ „
„ S. J. C. P. Perry	.. Dec. 1.	„ J. C. L. Hingston	.. „ „
„ H. W. Grattan	.. Jan. 5.	„ A. E. B. Jones	.. „ „
„ H. O. B. Browne-Mason	Nov. 12.	„ B. A. Odium	.. Feb. 2.
Captain M. M. Lowsley (by Exchange)	.. Oct. 7.	„ A. Hendry	.. Sept. 16.
„ G. J. S. Archer	.. „ „	„ J. R. Lloyd	.. „ „
„ E. P. Hewitt	.. Dec. 1.	„ W. J. Dunn	.. Feb. 11.
„ H. Simson	.. Nov. 12.	„ F. B. Dalglish	.. „ „
„ J. H. R. Bond (by Exchange)	.. Dec. 11.	„ M. Leckie	.. „ „
„ H. C. R. Hime	.. Jan. 14.	„ S. G. Walker	.. „ „
„ J. G. Churton	.. Dec. 11.	„ F. M. Hewson	.. „ „
„ R. T. Brown (by Exchange)	.. „ 1.	„ C. M. Rigby	.. „ „
Lieutenant M. P. Leahy	.. Feb. 2.	„ L. Murphy	.. „ „
		„ A. H. T. Davis	.. Sept. 30.
		„ J. S. McCombe	.. Feb. 11.
		„ W. J. Tobin	.. „ „
		„ R. O'Kelly	.. „ „

*For Attachment for Anti-typhoid Treatment to Battalions proceeding to India.*

Lieutenant G. F. Dawson	.. Dec. 1.	Lieutenant T. McC. Phillips	.. Sept. 29.
Lieutenant H. V. B. Byatt	.. Dec. 11.		

## GIBRALTAR.

Lieut.-Col. C. W. Johnson	.. Sept. 11.	Major J. E. Brogden (by Exchange)	.. „ „
Lieutenant H. S. Dickson	.. Dec. 30.		.. Sept. 11.

## MALTA.

Captain W. L. Baker	.. Sept. 11.	Major H. C. French	.. Sept. 11.
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## STRAITS SETTLEMENTS.

Captain R. McK. Skinner (by Exchange)	.. Oct. 1.	Captain B. R. Dennis	.. Oct. 1.
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## JAMAICA.

Captain W. M. Power (by Exchange) .. Middle November.

## BERMUDA.

Major E. W. W. Cochrane	.. Jan. 1.	Captain E. McDonnell	.. Jan. 1.
Captain W. L. Bennett	.. Jan. 1.		

## SOUTH CHINA.

Lieut.-Col. Sir J. Fayrer, Bart.	Oct. 1.	Captain A. D. Waring	.. Oct. 1.
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## EGYPT.

Major J. V. Forest	.. Sept. 11.	Lieutenant R. E. Todd	.. Dec. 11.
Captain E. E. Ellery	.. „ „	„ W. R. O'Farrell	.. Sept. 11.

## SOUTH AFRICA.

Lieut.-Col. R. I. D. Hackett (by Exchange)	.. Oct. 20.	Captain H. M. Morton (by Exchange)	.. Jan. 1.
„ S. E. Duncan	.. Jan. 1.	„ O. W. A. Elsner	.. „ „
„ R. Caldwell	.. Oct. 20.	„ E. W. Siberry	.. Sept. 15.
Major J. H. Rivers (by Exchange)	.. Sept. 15.	„ H. B. Fawcus	.. Feb. 10.
„ J. F. M. Kelly	.. Jan. 1.	„ G. Carroll	.. „ „
„ A. J. Chambers	.. Feb. 10.	„ F. McLennan	.. „ „
„ J. Poe	.. Oct. 20.	Lieutenant A. C. Vidal	.. Oct. 20.
		„ C. McQueen (by Exchange)	.. Sept. 15.

## WEST AFRICA.

Major J. D. Ferguson, D.S.O. { Early February. | Captain A. L. A. Webb .. { Early February.

**NOTES FROM DUBLIN.**—"Serjeant E. B. Dewberry, passed 'with Honors,' the Sanitary Inspectors' Examination, held recently in Dublin, by the Royal Institute of Public Health, London."

**NOTES FROM GIBRALTAR.**—Lieutenant-Colonel T. Du B. Whaité, R.A.M.C., writes:—

"The annual picnic to the cork woods proceeded in two parties on June 3 and 5, and much to their delight were favoured with perfect weather, which allowed of their resort to the old place beyond Almoraima Station, where a sumptuous collation was spread by Messrs. Dickeson and Co., under the shade of the cork trees. For the past couple of years, showery weather necessitated keeping to the station platform for shelter, and robbed the 'outing' of much of the picnic element.

"The parties proceeded at 9 a.m. in the Railway Company's Steamer 'Margarita' from the South Mole, and from Algeciras in special trains to the Woods. Donkey-riding and paddling in the river, fishing (?), and such like, filled in the time between meals, which were highly appreciated, and Gibraltar was reached about 7.30 p.m. The behaviour of the men was excellent, and everybody enjoyed themselves most thoroughly.

"Colonel Murray, Principal Medical Officer, went on leave on June 22, and Lieutenant-Colonel Faunce has since then been acting Principal Medical Officer.

"To the great regret of all ranks Corporal H. Page died in the Military Hospital on June 21, leaving a widow and child and three step-children badly provided for. The officers, non-commissioned officers, and men, subscribed to assist them, and the Company organised an open-air concert for their benefit, which realised a good sum, by a silver collection. Corporal Page was a thorough sportsman, good at football and cricket, and his popularity on the 'Rock' was well attested by the large numbers, from all corps in the garrison, who voluntarily attended his funeral. I send the following account of the benefit concert which appeared in the *Gibraltar Chronicle* of July 17:—

"The open-air concert given by 23 Company, Royal Army Medical Corps, with the assistance of friends in the Royal Navy and other corps of the Garrison, on Thursday night, in aid of the widow and children of the late Corporal Page, R.A.M.C., was certainly one of the best military concerts we have attended in Gibraltar. A very pretty stage, surmounted by the Corps' crest, had been erected on the parade ground and seating accommodation provided for over 800 persons. The audience numbered over a thousand in the square, and the road above, to Windmill Hill, was also crowded with spectators. A large number of officers of the garrison and of the Royal Navy were present. The excellent string band of the Bedfordshire Regiment added greatly to the success of the evening, and played three charming selections which were highly appreciated by the audience.

"There was not a poor item on the programme and encores were numerous. Comic songs were given by Lance-Corporal Beeley, R.E.; Private Dorset, Bedfords; Lance-Corporal Craggs, R.A.M.C.; Lance-Corporal Swann, R.A.M.C.; Mr. Ryder, R.N.; Staff-Serjeant Warne, A.O.C.; Sapper Dawson, R.E.; and Lance-Corporal Akers, R.E.—a very strong list of comic singers, all of whom kept the audience in roars of laughter. Serjeant Dickens, Bedfords, was heard to great advantage in his military and sentimental songs and in a duet with Mrs. Thompson. Quartermaster-Serjeant Flanagan, R.E., was in good voice; his two songs were deservedly encored. Private Lawrence, R.A.M.C., and Mr. Bennett, R.N., were also very successful in their sentimental songs. The latter is new to us; he has a good and well-trained voice which was heard to great advantage in the "The River of Years." The only lady singer, Mrs. Thompson, gave a charming rendering of "The Gift."

"The Instrumental part of the concert was also excellent. We are unable to select any one for special praise above the others. Corporal Wells, R.A.M.C., gave a violin solo, Corporal Berridge and Sapper Goodman, R.E., a banjo duet, Mr. Philpot, R.N., a first-rate cornet solo, and Corporal Sore, Bedfords, Lance-Corporal Reed and Mr. Hosken, a charming mandoline trio. Altogether a splendid concert.

"The Royal Army Medical Corps appreciate very highly the practical response to their appeal in aid of the widow and children of their late comrade; nearly £16 was collected. We hear that some ladies and gentlemen in Gibraltar, and a lady staying in Algeciras, who were unable to be present, kindly sent handsome subscriptions."

"On July 28, 1909, Lieutenant-Colonel Faunce, the officer in charge, and the officers of the Royal Army Medical Corps who are not on leave, gave a concert for the patients in the dining-hall of the Military Hospital. By kind permission of Major Coates and the officers of the Bedfordshire Regiment, their string band rendered valuable assistance under the ægis of Mr. Baxter, the Bandmaster.

"The following was the programme :—

- |                        |       |                                   |   |
|------------------------|-------|-----------------------------------|---|
| (1) <i>March</i>       | .. .. | 'The Gladiator's Farewell'        | String Band, 2nd Bedf. Regt.            |
| (2) <i>Song</i>        | .. .. | 'Till Dawn'                       | Lieut.-Col. WHAITE, R.A.M.C.            |
| (3) <i>Song</i>        | .. .. | 'Philosophy'                      | .. .. Mrs. GIRDLESTONE.                 |
| (4) <i>Song</i>        | .. .. | 'The Skipper of St. Ives'         | Surg. RAMSAY, R.N.                      |
| (5) <i>Song</i>        | .. .. | 'The Corporal's Ditty'            | Capt. CRAMER-ROBERTS, 2nd Norfolk Regt. |
| (6) <i>Violin Solo</i> | .. .. | 'Intermezzo'                      | .. .. Corpl. WELLS, R.A.M.C.            |
| (7) <i>Monologue</i>   | .. .. | 'A Tragedy in Five Acts'          | Mr. MACREADY, 2nd Bedf. Regt.           |
| (8) <i>Barcarolle</i>  | .. .. | 'Tales from Hoffmann'             | String Band, 2nd Bedf. Regt.            |
| (9) <i>Comic Song</i>  | .. .. | 'Jim'                             | Lance-Corpl. SWANN, R.A.M.C.            |
|                        |       | ( <i>Encore</i> ) 'Hamlet'        |   |
| (10) <i>Song</i>       | .. .. | 'The Ould Side-car'               | .. .. Lieut.-Col. WHAITE.               |
| (11) <i>Song</i>       | .. .. | 'Love's Coronation'               | .. .. Mrs. GIRDLESTONE.                 |
|                        |       | <i>Violin Obligato</i>            | .. .. Mr. LESLIE, R.G.A.                |
| (12) <i>Song</i>       | .. .. | 'Border Ballad'                   | .. .. Mr. PAYNE, R.G.A.                 |
|                        |       | ( <i>Encore</i> ) 'In Alcala'     |   |
| (13) <i>Song</i>       | .. .. | 'Thora'                           | .. .. Capt. CRAMER-ROBERTS.             |
| (14) <i>Comic Song</i> | .. .. | 'Troubles'                        | Pte. DORSET, 2nd Beds. Regt.            |
|                        |       | ( <i>Encore</i> ) 'How dare you?' |   |
| (15) <i>Fantasia</i>   | .. .. | 'Swanee River'                    | .. .. String Band.                      |
|                        |       | 'GOD SAVE THE KING.'              |   |

"After the concert, Lieutenant-Colonel Faunce and the officers of the corps were 'at Home' to their friends on the Tennis Court of the 'Bungalow,' which looked like a scene from fairy-land, illuminated by coloured electric lights, and assisted by 'Luna,' who most opportunely showed her fair face over the bold crag of rock which overhangs the court. More than a hundred guests sat down to a most excellent supper, and afterwards wandered about the grounds until long after midnight.

"At the King's Chapel at 11 a.m., on Sunday, 1st, a special service was held, when a memorial tablet was unveiled by His Excellency the Governor, to the memory of the late Sister Fitzgerald, Q.A.I.M.N.S.

"Miss Fitzgerald served some two years at the Military Hospital in this Station, and died at Millbank after an operation.

"The service was rendered by the King's Chapel choir. There were present in the congregation Colonel Faunce, Lieutenant-Colonel and Mrs. Whaite, Miss Richards (Matron of the Military Hospital), and all the Sisters of the Queen Alexandra's Imperial Military Nursing Service, and the Officers of the Royal Army Medical Corps who were not prevented by duty.

"There was a strong detachment of N.C.O.'s and men of the Royal Army Medical Corps, and among others in the congregation we noticed Colonel Williams, Major Leach, and Mrs. Seymour.

"At the conclusion of the short service His Excellency proceeded to the spot in the chancel where the Tablet was covered by the Union Jack, and, after drawing the flag aside, pronounced the following words: 'To the glory of God, and in beloved memory of Sister Adelaide Emily Fitzgerald, of the Queen Alexandra's Imperial Military Nursing Service, who died on February 23, 1908, after rendering her last days of faithful service to her God and King in this Garrison, we hereby dedicate this Memorial Tablet. In the name of the Father, and of the Son, and of the Holy Ghost. Amen.'

"Then the buglers of the 2nd Battalion the Norfolk Regiment, kindly lent by Lieutenant-Colonel H. Luard, D.S.O., for the occasion, who had taken their station in the gallery, played 'The Last Post' with great effect.

"The memorial tablet consists of a brass cross on a black background. On the cross the badge of the Nursing Service, and the inscription, 'Sacred to the memory of Sister Adelaide Emily Fitzgerald, Queen Alexandra's Imperial Military Nursing Service, who died February 23, 1908. Fear God: honour the King.'

"This 'Trooping Season' Lieutenant-Colonel Whaite and Major Berryman go home on completion of five years in this Station, and will be relieved by Lieutenant-Colonel G. W. Johnson and Major J. E. Brogden respectively."

**NOTES FROM WYNBERG.**—Serjeant-Major C. W. Kinsella, R.A.M.C., writes: "By yesterday's intermediate Union Castle boat, 'Durham Castle' sailed Colonel A. Peterkin, who vacates the appointment of Administrative Medical Officer, Cape Colony, for a like post in the London district. Since his arrival from Mauritius, Colonel Peterkin has shown the greatest interest in all ranks of the corps, and his departure is a matter of general regret.

"In his farewell order Colonel Peterkin expresses his thanks for the support tendered during his tenure of office, and expresses a hope that many will again serve under him—a wish which is respectfully and heartily reciprocated. A farewell dinner was given by the officers on Friday last, and all those not on duty attended at the Docks to wish the Colonel *bon voyage*.

"At a friendly football match held last Saturday between two local clubs, Springfield v. Aston Villa, one of the players (Mr. Mathew) was so unfortunate as to incur a fracture of the tibia, which was attended to by No. 15848 Corporal A. E. Garbett-Burbidge, R.A.M.C., who was playing for the first-named team. In commenting upon the match, the *South African News* of Monday speaks highly of the prompt and efficient manner in which first aid was rendered.

"Spells of damp weather have caused the temporary suspension of hockey matches, but since my last notes we have met and defeated Claremont (6—0), and several matches are contemplated.

"Major W. E. Hardy has assumed the duties of Administrative Medical Officer, and Major D. J. Collins those of Officer Commanding 22nd Company, Royal Army Medical Corps and Military Hospital, Wynberg."

**NOTES FROM CUREPIPE, MAURITIUS.**—Serjeant-Major W. Carey, R.A.M.C., writes under date June 4, 1909: "The 31st ult. being Whit-Monday, and observed as a holiday for the troops of the garrison, the 31st Company Royal Army Medical Corps spent a most enjoyable time in entertaining the Band of the 2nd Battalion Loyal North Lancashire Regiment.

"A cricket match was arranged for in the afternoon between representative teams from the band and 31st Company Royal Army Medical Corps, and although the weather (common to Mauritius) was anything but that desirable for cricket; still we managed to play a one-innings match, which resulted in a victory by the corps team to the extent of 4 wickets and 15 runs. Scores as follows:—

#### BAND, LOYAL NORTH LANCs.

Bandsman Weedon, b. Private Sandys .. .. .	1
Bandsman Woodward, b. Serjeant Rolfe .. .. .	18
Bandsman Gillespie, c. Serjeant-Major Carey, b. Serjeant Rolfe .. .. .	2
Corporal Murray, c. Private Sandys, b. Serjeant Rolfe .. .. .	4
Serjeant Reeves, run out .. .. .	1
Bandsman Lennox, run out .. .. .	20
Bandsman Dash, l.b.w., b. Private Freeman .. .. .	0
Lance-Corporal Dunbar, b. Serjeant Rolfe .. .. .	1
Bandsman Tettersington, run out .. .. .	13
Bandsman Reeves, c. and b. Private Freeman .. .. .	2
Lance-Corporal Hall, not out .. .. .	2
Extras .. .. .	12
Total .. .. .	76

#### 31st COMPANY R.A.M.C.

Private Freeman, c. Bandsman Dunbar, b. Bandsman Woodward .. .. .	20
Private Sandys, b. Bandsman Gillespie .. .. .	14
Serjeant Hughes, b. Bandsman Gillespie .. .. .	0
Major Campbell, not out .. .. .	21
Serjeant Rolfe, b. Bandsman Dash .. .. .	4
Serjeant-Major Carey, c. and b. Corporal Murray .. .. .	0
Private Batcock, b. Bandsman Gillespie .. .. .	9
Private James, not out .. .. .	16
Extras .. .. .	7
Total .. .. .	91

"Corporal Sharp, Privates Head and Clover did not bat.

"At 5.45 p.m. stumps were drawn, and an adjournment was then made to the Company dining room, where an ample and enjoyable tea was provided, of which eighty partook. At 7.30 p.m. our guests and the company assembled in the recreation room, where arrangements had been made for a smoking concert to be held, which was thoroughly appreciated by all those present, numbering close on 100. Our Commanding Officer, Major C. A. Young, R.A.M.C. and the Royal Army Medical Corps Officers stationed at Curepipe honoured the proceedings by their presence, and appeared to greatly enjoy the different items on the programme, particulars of which are appended below. The success of the concert is greatly attributed to the efforts displayed by Serjeant Rolfe, R.A.M.C., who brought together some of the best military talent on the island, notably, the most popular and favourite comedian, Corporal Thom, 43rd Company Royal Engineers, who is quite an entertainment in himself, and was repeatedly encored.

"The Officer Commanding 2nd Battalion Loyal North Lancashire Regiment kindly gave permission for a number of the bandsmen to bring their instruments, and the orchestra they formed rendered their items in a first-rate manner. The accompaniments were ably played by Professor Halbwachs.

"In conclusion, I may add that all thanks are due to the Committee, viz., Staff-Serjeant Carnell, Serjeant Rolfe, Corporal Ward, Privates Peters (H. F.) and Purnell, who were responsible for the catering and decorating features of one of the most enjoyable days spent by the Royal Army Medical Corps in Mauritius.

#### PROGRAMME.

##### PART 1.

<i>Pianoforte Solo</i>	..	..	..	Raff's 'Cavatina'	..	..	Prof. HALBWACHS.
<i>Song</i>	..	..	..	'Old Folks at Home'	..	..	Sergt. HUGHES.
<i>Selection</i>	..	..	..	'Country Girl'	..	..	ORCHESTRA.
<i>Song</i>	..	..	..	'Sentenced to Death'	..	..	Corpl. WARD.
<i>Cornet Solo</i>	..	..	..	'The Lost Chord'	ORCHESTRA	(Corpl. MURRAY).	
<i>Song</i>	..	..	..	'The Bandolero'	..	S.-Sergt. DE BRUIN, R.E.	
<i>Comic Song</i>	..	..	..	'Potted Poetry'	..	Corpl. THOM, R.E.	
<i>Comic Song (encore)</i>	..	..	..	'Silly Tommy'	..	..	
<i>Piccolo Solo</i>	..	..	..	'Louis du Bois'	ORCHESTRA	(Bdm. DEANS).	

##### Interval.

##### PART 2.

<i>Selection</i>	..	..	..	'Pick of the Basket'	..	..	ORCHESTRA.
<i>Comic Song</i>	..	..	..	'A Breach of Promise Case'	..	Bdm. HORNBLow.	
<i>Song</i>	..	..	..	'Thora'	..	S.-Sergt. DE BRUIN, R.E.	
<i>Serenade</i>	..	..	..	'Sizilietta' (encored)	..	ORCHESTRA.	
<i>Comic Song</i>	..	..	..	'Hi! Johnny, who's your Tailor?'	..	Corpl. THOM, R.E.	
<i>Comic Song (encore)</i>	..	..	..	'Kindness Rewarded'	..	..	
<i>Song</i>	..	..	..	'In Old Madrid'	..	Bdm. DELANEY, R.G.'A.	
<i>Galop</i>	..	..	..	'Von Haus, zer Haus'	..	ORCHESTRA.	
<i>Song</i>	..	..	..	'The Diver'	..	Corpl. WARD.	
<i>Comic Song</i>	..	..	..	'The Railway Porter'	..	Corpl. THOM, R.E.	
<i>Song</i>	..	..	..	'Absent without Leave'	..	Bdm. WEEDON.	
'GOD SAVE THE KING.'							

#### LIST OF CASUALTIES:—

*Discharges.*—5938 Serjeant-Major A. T. Green, August 12, 1909, having reached the age; 16015 Staff-Serjeant H. Kirton, August 8, 1909, termination of engagement; 8102 Lance-Serjeant J. Davies, August 14, 1909, termination of second period; 19637 Private R. F. Ebnor, July 13, 1909, medically unfit; 19737 Private A. Clinton, August 10, 1909, medically unfit.

*Transferred to Army Reserve.*—15198 Private C. Q. Craig, July 11, 1909; 402 Private A. Sebeck, July 11, 1909; 437 Private R. H. Page, July 17, 1909; 15957 Corporal J. W. Wildish, July 15, 1909; 444 Private H. Blackwell, July 15, 1909; 17616 Private W. C. Stradling, July 17, 1909; 407 Private A. Budd, July 13, 1909; 441 Private W. J. Higgins, July 18, 1909; 15981 Corporal R. Hayes, July 24, 1909; 15959 Private J. J. Carré, July 21, 1909; 473 Private F. G. West, July 23, 1909; 15951 Private

C. A. James, July 21, 1909; 15987 Private S. Robinson, July 26, 1909; 17887 Private E. D. Gough, July 26, 1909; 15999 Private A. Bye, July 26, 1909; 500 Private J. Majury, July 29, 1909; 16001 Private S. McConaghy, July 28, 1909; 17053 Private D. Powell, July 26, 1909; 15998 Private V. Page, July 25, 1909; 505 Private E. P. Morris, July 31, 1909; 504 Private D. Barnett, July 31, 1909; 518 Private E. S. Norrie, July 31, 1909; 540 Private W. T. Clear, August 8, 1909; 16007 Private C. Blatch, August 6, 1909.

*Transferred to other Corps.*—1892 Private A. C. Habgood, July 27, 1909, to Hampshire Regiment.

#### TRANSFERRED FROM OTHER CORPS.

2293 Private O. H. Stowe, July 15, 1909 (from R.F.A.).

#### THE FOLLOWING N.C.O.'S AND MEN HAVE QUALIFIED FOR PROMOTION IN THE VARIOUS CORPS EXAMINATIONS.

*For Quartermaster-Serjeant.*—8609 Staff-Serjeant G. Cookson.

*For Serjeant.*—16569 Lance-Serjeant E. Attfield.

*For Corporal.*—17001 Private D. Blair, 17421 Private P. Plume, 19547 Private W. A. Mansell, 391 Private W. J. Scorey, 2113 Private H. Bickers, 19179 Private V. R. Mirams, 19433 Private H. Blake, 795 Private H. H. Hunt.

*Disembarkations from Abroad.*—19279 Private H. E. Mars, July 14, 1909, from South Africa per s.s. "Gaika"; 18445 Corporal J. E. Crawley, July 17, 1909, from Sierra Leone per s.s. "Nigeria"; 18966 Private A. E. Whitney, July 17, 1909, from Sierra Leone per s.s. "Nigeria"; 19580 Private J. F. St. George, August 11, 1909, from Jamaica per s.s. "Port Kingston."

**Promotions.**—The following promotions will take effect from the dates specified, to complete the establishment authorised for 1909-10:—

#### To be Serjeant-Majors.

No.	Rank and Name	Date	Section	Remarks
9135	Qmr.-Serjt. E. H. Senior	4.4.09	..	Vice J. T. W. Hayward, to pension.
9203	„ E. Edser ..	4.4.09	..	„ F. Soule, to pension.
9263	„ W. Brennan	27.6.09	..	„ A. Harwood, to pension.
9258	„ E. O'Hara ..	13.8.09	..	„ A. T. Green, to pension.

#### To be Quartermaster-Serjeants.

9722	Staff-Serjt. W. J. Tite ..	4.4.09	..	Vice E. H. Senior, promoted.
10142	„ T. W. Cardwell	4.4.09	..	„ E. Edser, promoted.
8836	„ G. W. Petch	15.6.09	..	„ H. H. Taylor, to pension.
8994	„ C. Kingston	27.6.09	..	„ W. Brennan, promoted.

#### To be Staff-Serjeants.

11338	Serjt. W. Grove.. ..	4.6.09	..	Vice H. Lyons, to pension.
11173	„ C. J. Hazell ..	15.6.09	..	„ G. W. Petch, promoted.
7746	„ G. O. Cowthard ..	22.6.09	..	„ C. Parnell, to Territorial Forces.
11353	„ M. E. Lackey ..	27.6.09	..	„ C. Kingston, promoted.

*To be Serjeants.*

No.	Rank and Name	Date	Section	Remarks
8763	Lce.-Serjt. H. Yeoman*	29.3.09	General Duty	Under para. 349, King's Regulations. On appointment as Serjeant-Instructor to the London University Contingent, Officers' Training Corps. W.O. Letter 9/ Officers' Training Corps/ 109 (A.M.D. I.), dated 24.5.09
10449	„ J. Wilkin ..	4.6.09	Cooking ..	Vice W. Grove, promoted. (Special as Superintending Cook)
10884	„ G. Conboye..	15.6.09	Nursing ..	„ C. J. Hazell, promoted.
18924	„ D. Parker ..	22.6.09	„ ..	„ G. O. Cowthard, promoted.
10108	„ W. Hinde ..	27.6.09	„ ..	„ T. Davey, to pension.
9911	„ J. H. R. Boulton	27.6.09	General Duty	„ M. E. Lackey, promoted.

\* With seniority next above No. 16205 Serjeant T. Gregson.

*To be Corporals.*

16482	Lce.-Cpl. W. C. Leppington	} 1.7.09 {	General Duty	} To complete Establishment, 1909-10.
11919	„ A. Bateman ..		Nursing ..	
12088	„ G. Wells ..		General Duty	
12686	„ W. H. Chatfield		„ ..	
12756	„ F. H. Jones ..		Q.A.I.M.N.S.	
15981	„ R. Hayes ..		General Duty	
16069	„ A. Alderton ..		Nursing ..	
16323	„ W. McKenna..		„ ..	
17280	„ A. Lindford ..		„ ..	
16677	„ C. McDonald..	} 1.7.09 {	„ ..	} To complete Establishment, 1909-10.
16917	„ A. Fish ..		Cooking ..	

**Appointments.**—The following appointments, to complete Establishment, will take effect from the dates specified :—

*To be Lance-Serjeants. (As Dispensers).*

14926	Corpl. W. P. S. Morman	} 1.7.09 {	Nursing ..	} To complete Establishment, 1909-10.
15027	„ W. Bush ..		General Duty	
11405	„ W. Scott ..		Nursing ..	
18453	„ F. A. Phillbrook		General Duty	
17576	„ J. R. Ireson ..		„ ..	
17748	„ C. H. Dissent ..		„ ..	



*To be Lance-Corporals.*

No.	Rank and Name	Date	Section	Remarks
18865*	Private J. Ward ..	14.6.09	General Duty	To complete Establishment, 1909-10.
18657*	" V. Tripp ..	18.6.09	Clerical ..	
18988*	" R. H. T. Haigh ..		General Duty	
19192*	" F. Poole ..		Nursing ..	
19595*	" C. E. Bull ..	16.7.09	Clerical ..	
19933*	" W. C. Savegar ..		..	
10754	" A. T. Cooper ..		General Duty	
10992	" W. Murray ..		"	
11153	" S. Wood ..	1.7.09	Nursing ..	
12362	" T. Porter ..		Cooking ..	
14172	" E. W. Livermore ..		Nursing ..	
17412	" T. A. Oswald ..		Superintending Cook ..	
17501	" J. Christie ..		1st Class Clerk	
17714	" A. R. Robinson		Q.A.I.M.N.S.	

\* Special under para. 281, Standing Orders.

**Award of Army Form C 344.**—The following Non-Commissioned Officers and Orderlies were successful at the recent examination for Army Form C 344, "Certificate of Training as Nurse," held in May, 1909. (Home Stations.)

No	Rank and Name	Station	Percentage of Marks	Order of merit as regards number of marks awarded
720	Private S. G. Sandford ..	Netley .. ..	0·83	1
19660	" A. J. Webb .. ..	" .. ..	0·82	2
19449	" W. Charles .. ..	London .. ..	0·82	3
298	" J. D. Sheehan .. ..	Netley .. ..	0·81	4
19939	" F. M. Capon .. ..	" .. ..	0·80	5
754	" H. Russell .. ..	Connaught Hospital	0·78	6
17520	Lance-Corporal C. Good ..	London .. ..	0·75	7
874	Private F. A. Johnson .. ..	Woolwich .. ..	0·74	8
73	" F. Ellard .. ..	Chatham .. ..	0·74	9
935	" H. M. Griffith-Williams	Curragh .. ..	0·74	10
105	" F. Newman .. ..	Netley .. ..	0·72	11
19884	" F. E. Hort .. ..	Woolwich .. ..	0·72	12
380	" L. J. Hort .. ..	London .. ..		
407	" A. Budd .. ..	" .. ..	0·71	13
18678	Serjeant L. S. Ellis .. ..	Shorncliffe .. ..	0·71	14
19079	Private E. G. Stonesham	Dover .. ..		
18973	Corporal J. J. Abbott .. ..	London .. ..	0·69	15
148	Private T. H. Allbeury ..	Woolwich .. ..	0·68	16
518	" E. S. Norrie .. ..	London .. ..	0·68	17
16955	" C. White .. ..	Woolwich .. ..	0·66	18
193	" H. P. Truscott .. ..	Dublin .. ..	0·66	19
17815	" W. E. J. Fruin .. ..	London .. ..		
18957	Corporal A. C. Smith .. ..	Curragh .. ..	0·64	20
17280	Lance-Corporal A. Lindford	Cambridge Hospital	0·63	21
1072	Private H. A. French .. ..	London .. ..		
14569	Corporal F. Littleworth	Curragh .. ..	0·63	22
764	Private R. Boddy .. ..	Cambridge Hospital	0·62	23
18873	" W. J. Spiers .. ..	Woolwich .. ..		
18513	" A. Holland .. ..	Netley .. ..		
511	" F. Beauchamp .. ..	Connaught Hospital	0·61	24
19119	" W. E. Bennett .. ..	Hounslow .. ..	0·60	25
1070	" G. H. Harwood .. ..	London .. ..	0·59	26
18569	Corporal C. Colbert .. ..	Colchester .. ..		
11827	" W. White .. ..	Cosham .. ..	0·59	27
17584	Lance-Corporal W. Preston	Colchester .. ..	0·58	28
18736	Private E. C. Franklin ..	Chatham .. ..	0·57	29
19073	" E. W. Leach .. ..	Lichfield .. ..	0·57	30
18770	" J. A. Fosh .. ..	Dover .. ..	0·56	31

**Nursing Section.**—The following appointments to the Nursing Section of the Corps will take effect from the dates specified:—

No.	Rank and Name	Date	No.	Rank and Name	Date
1715	Pte. H. G. Rogers ..	8.4.09	1860	Pte. A. J. Wood ..	17.5.09
18891	„ C. Rainger ..	16.4.09	1990	„ J. W. Parker ..	24.5.09
1879	„ T. Harris ..		19097	„ A. Koftoff ..	
1884	„ E. S. Gaughan ..		2200	„ A. Preece ..	
1889	„ J. T. Wilkes ..		1514	„ S. W. Harrod ..	
1914	„ E. Dugmore ..		2027	„ E. H. Coney ..	
1920	„ E. E. Ford ..	19.4.09	2080	„ W. R. Foote ..	26.5.09
1945	„ A. Chapman ..		2106	„ J. Macdonald ..	
1969	„ G. W. Oeerton ..		559	„ W.H.J.Larrington	28.5.09
2083	„ W. G. Pearce ..		1946	„ E. Jane ..	1.6.09
2095	„ P. J. Rudd ..		*600	„ A. F. Day ..	4.6.09
1764	„ H. W. Seldon ..		1600	„ F. T. H. Godden	
1953	„ H. Marchant ..	21.4.09	1716	„ F.G.H.Duncombe	7.6.09
2002	„ G. Craddock ..		1848	„ A. V. Martins ..	
1053	„ G. C. Sainz ..		1932	„ W. E. Neville ..	
1357	„ E. S. Cary ..	22.4.09	1388	„ J. Lewis ..	9.6.09
1628	„ F. Rogers ..		1714	„ W. Blowers ..	
1912	„ W. Higginson ..	14.5.09	†43	„ A. W. Harding ..	15.6.09
1998	„ E. Patrick ..		2000	„ C. G. Jefferies ..	
1742	„ I. Darwin ..	17.5.09	17363	„ J. Bradshaw ..	29.6.09
1851	„ J. McVey ..		1713	„ F. B. McCarthy	

\* Appendix 2, III. (2), Standing Orders.

† Reappointed.

**Advancement of Privates (Corps Pay).**—(1) The following advancements in rate of Corps Pay will take effect from July 1, 1909.

*To be Advanced to the Third Rate (at 8d.).*

*As Orderlies.*

No.	Name	No.	Name	No.	Name
12245	Penney, C. F.	18982	Newman, A.	19864	Pitt, T. R.
16955	White, C.	19003	Hamilton, A.	19884	Hort, F. E.
17421	Plume, P.	19054	Evans, C.	19937	Platford, G. T.
17898	Knagg, W.	19119	Bennett, W. E.	19980	Loder, H. J.
18288	Wheeler, C.	19312	Turner, W.	368	Gorman, R.
18427	Barber, P.	19709	Young, W. E.	874	Johnson, F. A.
18725	Loweth, I.	19858	Quickenden, G. J.	909	Lockyer, F. G.

*As Clerks.*

18504	Hall, W. J.	19763	Luxon, A. J.	96	McMurdo, E. L.
19640	Hollands, G. H.	19851	Claydon, P. E.	273	McSorley, J.
19685	McGinnis, P.				

*To be Advanced to the Fourth Rate (at 6d.).*

*As Orderlies.*

12357	Griffin, H. W.	19757	Rickard, V.	1256	Dignam, J.
17679	Hockley, S.	19821	Young, B. L.	1336	Dovey, C.
17699	Morrall, C.	19823	Kilyon, T. J.	1344	Shelley, W. C.
17853	Douglas, W.	19905	Sidebotham, N.	1355	Wilson, J.
17887	Gough, E.	19962	Hill, J. D.	1418	Gentry, G. J.
18014	Yate, B. J.	95	Thomas, A. G. W.	1475	Bamford, W. J.
18285	Chambers, J.	257	Coles, R. J.	1491	Harding, G.
18344	Hayden, A.	284	Gregory, A. O.	1498	Miller, E.
19030	Mann, R. S.	418	Horsfall, B.	1530	Kennett, P.
19085	Vinton, C. J.	809	Rowland, T.	1531	Kilby, F. J.
19433	Blake, H.	890	North, J. P.	1554	Goldsbrough, R. E.
19439	Weller, G. A.	1097	Herbert, R.	1556	Calvert, N. B.
19469	Purnell, H. D.	1101	Barnacott, L.	1617	Eaton, C.
19598	Dawes, P.	1115	Beasley, W.	1847	Ogg, R. W.

*As Clerks.*

No.	Name	No.	Name	No.	Name
16578	Tait, W. W.	19626	White, E. F.	1276	Cooper, H.
18585	Mills, F.	19641	Hardie, W. M.	1827	Spratt, T. F.
18906	Whyatt, T. G.	19898	Ames, C. M.	1843	Mack, C. A.
19454	Renshaw, E. S.	97	Shave, A. A.		
19508	Fenton, E.	521	Triebwasser, G. O.		

*As Cooks.*

15764	Ellison, G.	18512	Walkden, J.	19517	Harrison, R. G.
17763	Shearn, W. J.	18866	Thomas, N.	19525	Thomason, H. J.
18191	Farrell, J.	18867	Hogg, T.	19765	Stanton, E.
18289	Tweed, L.	19499	Walker, F. C.	139	Simons, F. H.

(2) The following advancement in Rate of Corps Pay will take effect from March 9, 1909:—

*To be Advanced to the Fourth Rate (at 6d.)*

*As an Orderly.*

17123 | Sawyer, W. H. | Special for good serve on Indian Transport *Rewa*.

**Sanitary Orderlies (Corps Pay).**—The following Privates are advanced to the Fourth Rate of Corps Pay at 6d., as Sanitary Orderlies, from the dates specified:—

No.	Name	Date	No.	Name	Date
10	Cushing, G. F.	4.2.09	19574	Howe, T.	1.5.09
153	Richardson, G. T.	20.3.09	249	Scovell, A. H.	15.5.09
783	Sullivan, H.	30.3.09	19730	Young, W. T.	22.5.09
1864	Lowe, F.	30.3.09	2150	Fraser, E. G.	28.5.09
1892	Habgood, A. C.	2.4.09	1527	Way, S. E.	18.6.09
1630	Riley, E.	29.4.09			

**Buglers.**—The following Boys are appointed Buglers from the date specified:—

No.	Name	Date	No.	Name	Date
1577	Burnett, G. A.	3.5.09	1859	Green, W. R.	15.6.09
1825	Williams, A. G.	3.5.09	2040	Freeston, J. H.	26.7.09
2189	Munden, J. W. F.	3.5.09			

**Promotion Cancelled.**—The promotion to Corporal of No. 10555, Lance-Corporal W. C. Holden, notified in Corps Order No. 13 of 1909, is hereby cancelled.

**Reversions.**—The following Lance-Corporals are reverted to their permanent grade from the date specified:—

No.	Name	Date	No.	Name	Date
17869	*Pulling, W.	8.5.09	17051	Potts, W. E.	9.6.09

\* At own request.

**Sanitary Orderly (Corps Pay).**—The advancement to the Fourth Rate of Corps Pay at 6d. as a Sanitary Orderly of No. 18592 Private A. J. Toomey, notified in Corps Orders No. 17 of 1909, is hereby cancelled.

**SPECIAL RESERVE OF OFFICERS.**

ROYAL ARMY MEDICAL CORPS.

Supplementary List, Lieutenant Denis Murphy to be Captain, dated July 4, 1909.

## TERRITORIAL FORCE.

### YEOMANRY.

*Westmorland and Cumberland.*—The undermentioned officers from the Westmorland and Cumberland Imperial Yeomanry are appointed to the regiment, with rank and precedence as in the Imperial Yeomanry, dated April 1, 1908.

Surgeon-Major Joseph Edward Bowser, M.B.; Surgeon-Lieutenant John Livingstone, M.B.

### ROYAL FIELD ARTILLERY.

*2nd South Midland Brigade.*—Supernumerary Surgeon-Lieutenant George Mackie is absorbed into the establishment, dated March 31, 1909.

### ROYAL GARRISON ARTILLERY.

*Glamorgan.*—The undermentioned officers from the 2nd Glamorganshire Royal Garrison Artillery (Volunteers) are appointed to the unit, with rank and precedence as in the Volunteer Force, dated April 1, 1908:—

Surgeon-Major John Lynn Thomas, C.B., F.R.C.S.

Surgeon-Captain Robert John Richard Cobden Simons.

Surgeon-Captain Charles Octavius Parsons.

### ROYAL ARMY MEDICAL CORPS.

*London Mounted Brigade Field Ambulance.*—The promotion to the rank of Lieutenant-Colonel of Major (Honorary Major in the Army) Charles Stonham, C.M.G., bears date April 1, 1908, and not March 5, 1909, as stated in the *London Gazette* of March 26, 1909.

*1st South Midland Mounted Brigade Field Ambulance.*—Captain William H. Stephen, M.B., to be Major, dated June 21, 1909.

*Yorkshire Mounted Brigade Field Ambulance.*—Ernest Alfred Greenwood to be Transport Officer, with the honorary rank of Lieutenant, dated June 2, 1909.

*1st Home Counties Field Ambulance.*—The appointment as Transport Officer, with the honorary rank of Lieutenant, of Quartermaster and Honorary Lieutenant Bernard D. Hobson, bears date April 1, 1908, and not April 1, 1909, as stated in the *London Gazette* of June 25, 1909.

*2nd Highland Field Ambulance.*—Lieutenant John Innes, M.B., to be Captain, dated June 2, 1909.

*1st London (City of London) Field Ambulance.*—The undermentioned officers to be Captains:—

Lieutenant Percival G. A. Bott, M.B., dated April 30, 1909.

Lieutenant Andrew Elliot, M.D., dated June 17, 1908.

*3rd Lowland Field Ambulance.*—William Kelman Macdonald, M.B., to be Lieutenant (to be supernumerary), dated April 1, 1908.

*3rd Wessex Field Ambulance.*—Lieutenant-Colonel Harry M. Brownfield resigns his commission, and is granted permission to retain his rank and to wear the prescribed uniform, dated June 5, 1909.

Edmund Alderson, M.D., to be Lieutenant, dated June 16, 1909.

### *For attachment to Units other than Medical Units.*

Samuel Ryder Russell Matthews to be Lieutenant, dated May 1, 1909.

Albert Alexander Gunn, M.B., to be Lieutenant, dated June 16, 1909.

Thomas Nash Thomas to be Lieutenant, dated June 17, 1909.

*1st Highland Field Ambulance.*—John Douglas Fiddes, M.B., to be Lieutenant, dated June 10, 1909.

*2nd North Midland Field Ambulance.*—Richard Milbourne West, M.D. (late Captain, 5th Northern General Hospital, Royal Army Medical Corps), to be Lieutenant, dated June 9, 1909.

*1st Wessex Field Ambulance.*—Lieutenant Alexander W. F. Sayres to be Captain, dated June 13, 1909.

*5th Northern General Hospital.*—Captain Richard M. West, M.D., resigns his commission, dated June 9, 1909.

*3rd Southern General Hospital.*—Officer whose services are available on mobilisation:—

Arthur Latham Ormerod, M.D., to be Captain, dated July 10, 1909.

*Attached to Units other than Medical Units.*

Captain Charles K. Bowes, M.D., resigns his commission, dated June 15, 1909.

*For attachment to Units other than Medical Units.*

Lionel Danyers Bailey to be Lieutenant, dated June 19, 1909.

**ROYAL ARMY MEDICAL CORPS.**

*1st South-western Mounted Brigade Field Ambulance.*—Major George R. Swinhoe resigns his commission, dated May 13, 1909.

*For attachments to Units other than Medical Units.*

Arthur Herbert Norris to be Lieutenant, dated June 22, 1909.

**ROYAL ARMY MEDICAL CORPS.**

*1st London (City of London) Field Ambulance.*—Frank Stanley Turner to be Transport Officer with the honorary rank of Lieutenant, dated July 2, 1909.

Alexander Boarg Mount to be Quartermaster with the honorary rank of Lieutenant, dated July 7, 1909.

*1st Welsh Field Ambulance.*—Lieutenant John F. Dwyer resigns his commission, dated June 17, 1909.

*For attachment to Units other than Medical Units.*

The announcement of the transfer of Surgeon-Major Joseph Edward Bowser, M.B., and Surgeon-Lieutenant John Livingstone, M.B., from the Westmorland and Cumberland Imperial Yeomanry, which appeared in the *London Gazette* of April 27, 1909, is cancelled.

Surgeon-Lieutenant-Colonel (Honorary Major in the Army) William John Naismith, D.S.O., M.D., from the Ayrshire (Earl of Carrick's Own) Imperial Yeomanry, to be Lieutenant-Colonel, with precedence as in the Imperial Yeomanry, dated April 1, 1908.

Lieutenant-Colonel (Honorary Major in the Army) William J. Naismith, D.S.O., M.D., is retired, under the provisions of Paragraph 59, Territorial Force Regulations, and is granted permission to retain his rank and to wear the prescribed uniform, dated April 28, 1909.

Henry Randall Wadd to be Lieutenant, dated June 7, 1909.

Lewis Beesly to be Lieutenant, dated June 17, 1909.

Thomas Henry La Nauze Hewitt to be Lieutenant, dated June 23, 1909.

Thomas Francis Roche to be Lieutenant, dated June 23, 1909.

**ROYAL ARMY MEDICAL CORPS.**

*Eastern Mounted Brigade Field Ambulance.*—Transport Officer and Honorary Lieutenant George S. Wilkinson resigns his commission, dated June 16, 1909.

John Ashurst to be Transport Officer, with the honorary rank of Lieutenant, dated June 16, 1909.

*6th London Field Ambulance.*—Henry King Dawson, M.D., to be Lieutenant, dated July 6, 1909.

*For attachment to Units other than Medical Units.*

Captain William Starbuck Griffith, M.B., from the Sanitary Service, to be Captain, dated March 1, 1909.

William Evelyn Alston, M.B., to be Lieutenant, dated July 1, 1909.

The appointment to a Lieutenancy of William Henry Newton bears date February 21, 1909, and not March 1, 1909, as stated in the *London Gazette* of July 6, 1909.

*Attached to Units other than Medical Units.*

Lieutenant Alfred L. Low resigns his commission, dated March 31, 1909.

Captain Alexander P. Swanson to be Major, dated November 23, 1908.

Captain Martin A. Cooke to be Major, dated June 20, 1908.

Ivan Cochrane Keir, M.D. (late Lieutenant, 4th Battalion the Duke of Edinburgh's [Wiltshire Regiment]), to be Lieutenant, dated July 1, 1909.

**VOLUNTEERS.**

*Eastern Command, Woolwich Companies Royal Army Medical Corps.*—Captain William H. Payne resigns his commission, dated March 31, 1908.

**CADET BATTALIONS AND CORPS.**

*1st Cadet Battalion, the King's Royal Rifle Corps.*—William Henry Davis to be Surgeon-Lieutenant, dated July 8, 1909.

## **NOTES FROM THE CAMP OF THE ROYAL ARMY MEDICAL CORPS TERRITORIAL FORCE, LOWLAND DIVISION, TROON.**

The Field Ambulance of the Lowland Division were encamped at Troon for fifteen days, training under Lieutenant-Colonel W. F. Somerville.

The duties of Camp Adjutant were performed by Captain A. M. Fraser, R.A.M.C., Adjutant, School of Instruction, Royal Army Medical Corps Territorial Force, Lowland Division.

The advance parties from Glasgow entrained on Wednesday, July 14, and were followed on the 16th by the 1st Lowland Field Ambulance under Lieutenant-Colonel W. F. Somerville, the 2nd Lowland Field Ambulance under Lieutenant-Colonel A. D. Moffatt, the Lowland Mounted Brigade Field Ambulance under Lieutenant-Colonel R. T. Halliday, and the Advance Party of the 3rd Lowland Field Ambulance under Major Mackintosh.

Owing to inclement weather and delay in receiving camp equipment very little work had been done by the advance parties, but within an hour of the arrival of the units the camp was pitched and men told off to their tents.

Considerable difficulty was experienced in picketing some of the draught horses, as the ground being very sandy and wet the ordinary picketing pegs were not long enough to hold the heavier horses, and these had to be tethered to wagons for the night.

During the afternoon the transport sections were kept busy bringing ordnance stores and baggage from the station, but it was found out that much of the equipment indented for had not arrived, and amongst the missing articles were the blankets of the 1st Lowland Field Ambulance. Thanks to the kindness of Colonel Pearson, Lowland Division Engineers, we were able to borrow sufficient blankets to give one to each man in the unit; this was a great relief to all as the weather was very bad.

Saturday was well spent in getting the camp in order, and the Sanitary Officers, Captain Bruce and Captain Brownlow Riddle, had their squads employed in building destructors, refuse pits, soak pits, and grease traps.

The camp was deserted in the afternoon, as the majority of the N.C.O.'s and men were visiting Troon, and the adjacent camps of the Divisional Engineers, and 8th Highland Light Infantry at Wallacefield, and the Scottish Rifle Brigade at Lochgreen.

The weather was not very promising, and as night approached the wind and rain increased, with the inevitable result that many spent a sleepless night. A fatigue party was employed for over two hours after midnight, driving in tent pegs and attending to tent ropes; their labour was rewarded by the Royal Army Medical Corps tents standing firm, while in the adjacent camp several marquees and bell tents were blown down.

On Sunday morning the Army Act was read before church parade. This gave rise to much discussion amongst the younger soldiers, and, referring to the penalty of death, one recruit was heard to say, "Jimmy, if I get out o' this camp wi' my head on my ane shoulders, I'll dae weel."

Church parade was conducted by the Rev. Thos. Adamson, D.D., Chaplain to the Lowland Division, Royal Army Medical Corps Territorial Force.

At midday the 3rd Field Ambulance, commanded by Lieutenant-Colonel A. Ross, marched into camp, thus bringing the total strength in camp to thirty-four officers, 799 other ranks.

Owing to the state of the water supply of the camp of the Lothians Brigade at Aberdour, all the filter water-carts had been withdrawn from the Field Ambulances to be used at Aberdour. This was a serious blow to the training of the water duty section, most of whom were with the Field Ambulance at Troon. General service wagons were not available, and the units had to be content with lorries and spring vans, some of which were not at all suitable for the work of the Ambulance. Each unit had three ambulance wagons, Mark V\*, the medical, surgical, and ordinary equipment for one section, so that, with the exception of the filter water-carts, the units were well equipped for training.

Reveille went at 5 a.m. on Monday morning, and the sound of "Hey, Johnnie Cope," played by the pipe band of the Glasgow units, aroused the camp. Soon after, horses were being watered and fed, and men were preparing for parade, and the serious work of the camp was begun. During the camp the hours before breakfast were devoted to company and stretcher drill, in the afternoons text-pitching, lectures on hygiene, medical and surgical equipment, discipline, &c., and between breakfast and dinner the units were exercised in the duties of field ambulances. The work was of a

very interesting nature, and in addition to the practical working of field ambulances, the officers, as a regimental exercise, worked out several problems based on a scheme, the general idea of which was that a force was lauded at Troon to march on Glasgow.

On Thursday, July 22, the units were inspected by Colonel Corker, P.M.O., Scottish Command, and the camp sports were held the same afternoon. The events were keenly contested, and although the weather was dull the sports were well attended. The prizes were presented by Mrs. Fred Smith.

On Friday, July 23, the camp was inspected by Colonel Babbie, V.C., Inspector of Medical Services. Sir George Thos. Beatson, A.M.O., Lowland Division, inspected the units on Monday, July 26; and the General Officer Commanding-in-Chief Scottish Command with General Kilham, General Officer Commanding Lowland Division, inspected the camp on Wednesday, July 28. A football tournament was held in camp, and in this the team of the 2nd Lowland Field Ambulance were successful.

On July 29 the 1st, 2nd and 3rd Field Ambulances were engaged in the operations in the vicinity of Dundonald. All the troops at Gables and Troon were employed.

The 1st and 2nd Lowland Field Ambulances and Lowland Mounted Brigade Field Ambulance left for Glasgow on the 30th, and the 3rd Lowland Field Ambulance entrained on Sunday, August 1, bringing to a close a very successful camp.

#### QUEEN ALEXANDRA'S IMPERIAL MILITARY NURSING SERVICE.

The following ladies have received appointments as Staff Nurse: Miss D. A. Scott, Miss J. Findlater.

*Postings and Transfers.*—Sisters: Miss M. Worthington, to Netley, from Edinburgh; Miss S. O. Beamish, to Edinburgh, from York; Miss J. M. Clay, to Cambridge Hospital, Aldershot, from Woolwich; Miss P. Steele, to London, from Colchester; Miss M. L. Harris, to Colchester, from Devonport. Staff Nurses: Miss K. J. Stewart, to London, on appointment; Miss C. M. Roy, to Woolwich, on appointment; Miss C. Macrae, to York, from Woolwich; Miss M. E. Medforth, to Chatham, from Cambridge Hospital, Aldershot; Miss I. D. Humfrey, to Cambridge Hospital, Aldershot, from Woolwich; Miss H. C. Johnston, to Woolwich, from Cambridge Hospital, Aldershot.

*Promotions.*—The undermentioned Sister to be Matron: Miss A. A. Murphy. The undermentioned Staff Nurses to be Sisters: Miss S. O. Beamish, Miss H. Hartigan, Miss M. C. Johnston, Miss H. M. E. Macartney, Miss E. M. Rentzsch.

### EXAMINATION OF MAJORS, ROYAL ARMY MEDICAL CORPS, FOR PROMOTION.

THE following questions were given at the May Examination in Sanitation and Epidemiology. (Time allowed, three hours. Total marks, 100.) [N.B.—Only four questions are to be answered. Questions 1 and 5 must be answered.]

(1) The following is the present scale of rations for field service:—

1½ lb. fresh beef, or 1 lb. preserved meat, or 1 lb. salt meat.

1½ lb. bread, or 1 lb. biscuit, or 1 lb. flour.

½ oz. tea.

½ lb. jam.

2 oz. sugar.

½ oz. salt.

¾ oz. pepper.

¾ lb. fresh vegetables, or 4 oz. dried vegetables, or 4 oz. preserved fruit.

1½ oz. limejuice with ½ oz. sugar on days when fresh vegetables are not issued.

1½ oz. rum.

1 Tobacco, not exceeding 2 oz. per week for those who smoke.

Give your opinions, with reasons for the same, on the following points:—

(a) As to the general sufficiency of the above ration. If you consider it sufficient,

<sup>1</sup> At the discretion of the General Officer Commanding on the recommendation of the medical officer. The above scale is intended merely as a guide; a special scale dependent on the climate and circumstances of the expedition will be fixed by the General Officer Commanding. The total energy value of the ration may be taken at 3,700 calories.

justify your opinion by practical experience, if possible, and also on theoretical grounds. If you consider it insufficient, to what height would you raise the calorie value? And state generally which of the alimentary principles you would rely on for the purpose of obtaining this increase, and what articles of diet you would employ.

(b) Apart from the question of sufficiency, do you consider the ration a suitable one as regards the various articles composing it? If so give your reasons, if not state what variations you would propose in view of a campaign in a European country where supplies of all kinds are available. (30 marks.)

(2) Do you recognize any difference between the two injuries known respectively as "heatstroke" and "sunstroke"? If so, what? Explain fully your views as regards the causation and prevention (not treatment) of these injuries, referring especially to clothing, equipment, food and drink in this connection. (20 marks.)

(3) General Stonewall Jackson used to make his men lie down at halts, saying, "A man rests all over when he lies down." Do you agree with the above maxim or not? In practice what difficulties do you see in carrying it out? (20 marks.)

(4) Give a review of the latest work in connection with the causation and prevention of yellow fever. (20 marks.)

(5) You are Senior Medical Officer of a force of 1,500 men, about to take a march across an almost waterless stretch of country. The water supply is from wells or ponds at considerable distances from each other, the position of which dictates the length of the various marches, and the situation of the camps. There are in all five such groups of wells between the starting point and the destination of the force, at both of which the water supply is plentiful. The point of destination is strongly held by our troops. The length of the various marches, and the water supply available at the end of each is given below:—

1st march, 10 miles. Ruined temple 8th mile.

1st camp. Supply liable to pollution; about 2,000 gallons available.

2nd march, 12 miles. Scattered ruins.

2nd camp. Supply liable to pollution; about 2,000 gallons available.

3rd march, 18 miles. Extensive ruins 11th mile.

3rd camp. Supply bad and scanty; only 800 gallons available.

4th march, 8 miles. Scattered ruins.

4th camp. Supply good and plentiful; about 10,000 gallons available.

5th march, 12 miles. Scattered ruins.

5th camp. Supply liable to pollution; about 2,000 gallons available.

6th march, 22 miles. Ruins of city 16th mile.

The amounts of water stated above are those available for drinking water. Transport animals need not be considered.

Carriage can be provided for 250 gallons of water in addition to the amount carried in the water-bottles, viz., 2 pints per man.

Draft a Brigade order dealing fully and precisely with all details of regulation of water supply. (20 marks.)

State in addition, but not necessarily in the form of an order, what arrangements of a special nature you would suggest with regard to the water supply at the 3rd camp, and on the 4th and 6th marches.

At what hours should the troops march and what halts would you suggest? (The mean shade temperature at the hottest time of the day is 90° F., with a mean humidity equivalent to 60 per cent. of saturation, and the sun rises at 5 a.m. and sets at 7 p.m. approximately.) (10 marks.)

(Total for Question 5, 30 marks.)

## RESULTS OF EXAMINATION OF MAJORS AND LIEUTENANTS, ROYAL ARMY MEDICAL CORPS.

The following results of examinations are notified for general information:—

Passed in Military Law for the rank of Lieutenant-Colonel: Majors E. H. Condon, A. C. Fox; A. E. Master, M.B. (75 per cent.); Captains W. H. S. Nickerson, V.C., M.B.; M. M. Lowsley; H. B. G. Walton; H. M. Morton (75 per cent.); E. W. Siberry (75 per cent.); J. A. Hartigan, M.B.; B. S. Bartlett (75 per cent.); J. G. Churton (75 per cent.); C. H. Furnivall (75 per cent.); E. Bennett (75 per cent.); A. J. W. Wells; P. G. Easton (75 per cent.).

Passed in Technical Subjects for the rank of Lieutenant-Colonel: Majors John M. Buist (80 per cent. in S. and E. and Med. Hist., &c.); P. Evans, M.B. (80 per cent. in Med. Hist., &c.).



Passed in (d) ii for the rank of Captain: A. C. Vidal; C. Cassidy (75 per cent.); A. Fortescue, M.B. (75 per cent.); M. P. Leahy, M.B.; W. G. Avis; G. F. Dawson, M.B. (75 per cent.); H. V. B. Byatt (75 per cent.); F. J. Stuart, M.B.; J. A. Renshaw; R. de V. King; D. B. McGrigor, M.B.; W. A. Spong, M.B. (75 per cent.); H. P. Hart, M.B.; A. E. B. Jones, M.B.; A. Hendry, M.B.; J. F. Grant, M.B.; Captain E. A. Bourke (75 per cent.); Lieutenant J. A. B. Sim, M.B. (75 per cent.); Lieutenant G. B. Edwards; Lieutenant J. H. Spencer, M.B. (80 per cent.); Lieutenant R. C. Galgey; Lieutenant W. K. Beaman; Lieutenant H. G. Gilson (75 per cent.); Lieutenant J. C. Hart, M.B. (75 per cent.).

Passed in (h) ii and iii for the rank of Captain: A. C. Vidal; C. Cassidy; A. Fortescue, M.B.; W. G. Avis; G. F. Dawson, M.B. (80 per cent.); F. J. Stuart, M.B.; J. A. Renshaw (80 per cent.); R. de V. King; D. B. McGrigor, M.B.; W. A. Spong, M.B. (80 per cent.); H. P. Hart, M.B.; A. E. B. Jones, M.B.; A. Hendry, M.B.; J. F. Grant, M.B.; Lieutenant G. B. Edwards; Lieutenant J. H. Spencer, M.B. (80 per cent.); Lieutenant R. C. Galgey; Lieutenant W. K. Beaman; Lieutenant H. G. Gilson (75 per cent.); Lieutenant J. C. Hart, M.B. (75 per cent.); Lieutenant H. M. J. Perry.

(h) ii.—H. V. B. Byatt; Lieutenant R. G. Archibald, M.B.; Lieutenant G. B. Edwards; Lieutenant J. H. Spencer, M.B. (80 per cent.); Lieutenant R. C. Galgey; Lieutenant W. K. Beaman; Lieutenant H. G. Gilson (75 per cent.); Lieutenant J. C. Hart, M.B. (75 per cent.); Lieutenant H. M. J. Perry.

(h) iii.—M. P. Leahy, M.B.; Lieutenant G. B. Edwards; Lieutenant J. H. Spencer, M.B. (80 per cent.); Lieutenant R. C. Galgey; Lieutenant W. K. Beaman; Lieutenant H. G. Gilson (75 per cent.); Lieutenant J. C. Hart, M.B. (75 per cent.); Lieutenant H. M. J. Perry.

<sup>1</sup> Special Certificate.

## ROYAL ARMY MEDICAL COLLEGE.

### EXAMINATION OF CAPTAINS FOR PROMOTION TO MAJOR.

*List of Subjects for Essays.*—Tuesday, July 20, 1909. From 10 a.m. to 1 p.m.

*Medical.*—[N.B.—One subject only to be selected.]

(1) Discuss the conditions under which cardiac dilation may occur, and the way in which you would deal with it.

(2) Discuss the causes and treatment of muscular tremor.

(3) Discuss the pathological conditions which may give rise to ascites, and its treatment.

(4) Discuss the cardiac tonics, and the toxic symptoms to which they may give rise.

(5) Discuss the prognosis of diabetes mellitus, and the complications that may arise, and the manner in which you would deal with them.

*Surgical.*—(1) Write an essay on the pathology, course and treatment of hydrophobia.

(2) Discuss the causes, pathology, symptoms and treatment of traumatic tetanus.

(3) Describe the varieties of spina-bifida with causes, prognosis and treatment.

(4) Describe the etiology and pathology of the clinical varieties of gangrene.

(5) Describe the causes, symptoms and treatment of intussusception of the bowel.

(6) Write an essay on the diseases of the pancreas from a surgical point of view.

(7) Describe the condition termed congenital dislocation of the hip and compare it with the deformity known as coxa vara.

*Medicine* (Written).—Tuesday, July 20, 1909. From 2.30 to 5.30 p.m.

(1) Describe a case of right hemiplegia, with special reference to pathology, causation, mode of onset, symptoms, course and prognosis.

(2) What are the symptoms and physical signs of aneurism of the abdominal aorta? What is its most usual situation? With what other conditions may it be confounded? Give the differential diagnosis. What treatment gives the best prospect of cure? Should it fail, what are the ways in which death may ensue?

(3) What are the varieties of leukæmia, as based on pathology? Give a full account of the changes in the blood in each variety. What are the usual symptoms, and what treatment may be adopted?

(4) Describe fully a severe case of variola, occurring in an unvaccinated patient. Give special details as to the primary fever, the eruption from day to day, the general symptoms and prognosis. What are the indications for treatment? How may previous vaccination modify the disease?

*Surgery* (Written).—Wednesday, July 21, 1909. From 10 a.m. to 1 p.m.

(1) Give an account of the inter-scapula-thoracic amputations (Berget), detailing the various steps and the structures divided.

(2) Describe the diagnosis, prognosis, and treatment of diastasis at the lower end of femur.

(3) State the more common varieties of traumatic stricture of the urethra, giving the history, site of lesion, effects, and treatment.

(4) What are the symptoms common to intracranial pressure due to irremovable brain tumour? Describe any surgical procedure likely to give relief.

*Military Surgery and Refraction and Skiagraphy* (Written). (As part of the Examination in Surgery.) Monday, July 26, 1909. From 10 a.m. to 1 p.m.

(1) Describe the injuries to blood-vessels produced by the small-bore bullet; enumerate the clinical conditions resulting from these injuries, and give briefly the symptoms and treatment of each.

(2) Discuss the diagnosis, prognosis and treatment of gunshot injuries of the spine.

(3) How are stereoscopic skiagrams taken? What advantages are gained by taking stereoscopic skiagrams?

(4) How would you take a skiagram of the kidney region in a case of suspected renal calculus? What are the chief difficulties in obtaining a satisfactory skiagram of this region, and how may they be overcome?

(5) Give a short account of hypermetropia, including its causation, symptoms and treatment. How may this condition affect the efficiency of a soldier?

#### EXAMINATION FOR COMMISSION IN THE ROYAL ARMY MEDICAL CORPS.

*Medicine.* — Case for Commentary. Wednesday, July 28, 1909. Commencing 10 a.m. (Time allowed, 1½ hours.) Read your instructions.

The patient was a man aged 34, anæmic and emaciated; by occupation a tailor. He stated that he had not drunk to excess or suffered from syphilis, and that up to the age of 25 his health had been good. He then had an illness of sudden onset accompanied by loss of power in the left arm and leg. In three weeks he regained power in his limbs. Nine months later he had a similar attack in which the loss of power, although less marked, was of more prolonged duration.

At the age of 29 years he suffered from an illness lasting seventeen months, which he described as a "nervous breakdown"; the most obvious symptoms appeared to have been headache, loss of memory, impaired mental and bodily activity, restlessness, and a "shaky" condition of the limbs; there was no definite loss of muscular power and no tremor.

At the age of 32 years he had an attack of abdominal pain with vomiting. The pain was referred to a spot in the middle line about the lower margin of the epigastric region; there was also tenderness at this site. Since that date he has had several recurrences of pain and vomiting, always accompanied by tenderness. In one of these attacks he was thought to be suffering from intestinal obstruction.

His digestion was impaired, but the abdominal symptoms were not connected with the taking of food. He had not suffered from hæmatemesis, melæna or jaundice; the vomited matters had never presented a coffee-ground appearance.

In July, 1908 (aged 34), he had a severe attack of epistaxis; the onset was sudden and without apparent cause. A few days later, on getting out of bed one morning, he suddenly felt giddy and fell down; he did not lose consciousness; the left arm and leg became weak, but not powerless. He was admitted to hospital on October 26, 1908.

The following is an abstract of the clinical notes: Temperature normal; bowels regular; pulse 76, weak, but regular; the arterial wall thickened; on protrusion the tongue points to the left side; there is decided loss of power in the left arm and leg; the cardiac apex is in the fifth interspace, 1 inch external to the nipple line, impulse heaving, a faint systolic murmur is audible at the apex; the second sound over the aortic cartilage is accentuated; the lungs, liver, and spleen appear to be normal; the urine is alkaline turbid, of specific gravity 10·6, and contains a small quantity of albumen, but no blood, pus or sugar.

About the level of the first lumbar vertebra an indurated mass, nearly 4 inches in length, can be felt, crossing the abdominal cavity. It is immovable, tender, and has an irregular surface.

The ophthalmoscopic examination showed disseminated choroiditis at the periphery in both eyes; pallor of the discs, with blurring of the edges; the veins paler than normal; recent hæmorrhages around the discs; white exudation in the region of the yellow spot.

On October 29 the patient had an epileptiform fit, in which there was conjugate deviation of the eyes to the left side. He recovered quickly and said "I have never come over like that before."

On November 7, at 12.15 p.m., he had a second fit and soon afterwards vomited. At 5 p.m. he began to lose consciousness, and at 6.55 p.m. he died.

Comment on the above case and state what lesions you would have expected to find on autopsy.

**Surgery.**—Case for Commentary. Wednesday, July 28, 1909. Commencing 11.30 a.m. (Time allowed, 1½ hours.) Read your instructions.

A married woman, aged 30, was admitted to hospital from the country with a fistula, discharging thin faecal matter, in the left groin. The fistula was just below the inner third of Poupart's ligament. Around it the skin was undermined and the subcutaneous tissue was sloughy.

The following history was sent by her doctor: "I was called to see Mrs. F. six weeks ago on account of persistent vomiting and violent epigastric pain. She had a tender swelling, about the size of a hazel nut, in the left groin, which, at the time, I thought was a gland. The swelling was dull on percussion. The bowels were freely opened after an enema, and, after a few days on rectal feeding, the vomiting ceased and the pain in the epigastrium subsided. The painful swelling in the groin, however, increased rapidly, and although there was never any fluctuation, a faecal fistula formed a fortnight after the commencement of her illness. The patient is wasting somewhat."

Indigo taken by the mouth appeared at the fistula just within two hours.

Discuss the diagnosis, also the various operative procedures for treating the case, according to the conditions which might be met with.

## ROYAL ARMY MEDICAL COLLEGE.

### RESULT OF THE EXAMINATION OF THE 1ST SENIOR COURSE, 1909.

Names	Certificate Awarded	Eligible for Accelerated Promotion	Qualified as Specialist in
<b>Captains:</b>			
H. Ensor .. .. .	2nd class	6 months	Bacteriology
L. W. Harrison .. .. .	"	"	"
C. C. Cumming .. .. .	"	"	"
W. M. H. Spiller .. .. .	"	"	"
M. G. Winder .. .. .	"	"	"
W. R. P. Goodwin .. .. .	"	"	Ophthalmology
W. M. Power .. .. .	3rd class	3 months	Midwifery
D. O. Hyde .. .. .	"	"	"
M. F. Foulds .. .. .	"	"	Operative Surgery
J. F. Martin .. .. .	"	"	"
H. B. Connell .. .. .	"	"	"
G. S. C. Hayes .. .. .	"	"	Midwifery
W. Davis .. .. .	"	"	"
G. J. Houghton .. .. .	"	"	"
T. Biggam .. .. .	"	"	"
E. B. Knox .. .. .	"	"	"
H. G. Pinches .. .. .	"	"	"
H. A. Davidson .. .. .	"	"	"
S. B. Smith .. .. .	"	"	"
E. Ryan .. .. .	passed	"	Midwifery
F. S. Walker .. .. .	"	"	"
C. H. Carr .. .. .	"	"	Dental Surgery
H. Rogers .. .. .	"	"	"
W. S. Crosthwait .. .. .	"	"	"
H. W. Long .. .. .	"	"	"
D. E. Curme .. .. .	"	"	"

DISTRIBUTION OF CAPTAINS FROM ROYAL ARMY MEDICAL COLLEGE,  
AUGUST 29, 1909.

*Aldershot Command.*—Captains T. Biggam, D. E. Curme, H. B. Connell, G. S. C. Hayes.  
*Southern Command.*—Captains C. H. Carr, W. M. Power, E. Ryan, H. G. Pinches, L. L. G. Thorpe, F. S. Walker.  
*Irish Command.*—Captains W. S. Crosthwait, H. A. Davidson, W. Davis, H. Rogers, D. O. Hyde, D. J. Houghton, H. W. Long, W. M. H. Spiller, S. B. Smith.  
*Eastern Command.*—Captains L. W. Harrison, E. B. Knox, J. F. Martin, J. P. T. Murphy, M. F. Foulds, A. O. B. Wroughton, M. G. Winder.  
*London District Command.*—Captain C. C. Cumming.  
*Royal Arsenal Command.*—Captain W. R. P. Goodwin.  
*Egyptian Army Command.*—Captain H. Ensor.

LIST OF SUCCESSFUL CANDIDATES FOR COMMISSIONS IN THE ROYAL ARMY MEDICAL  
CORPS AT THE RECENT EXAMINATION IN LONDON, FOR WHICH FIFTY-FOUR CANDIDATES ENTERED.

Names	Medical School	Qualifications	Marks
G. H. Dive .. ..	St. Bartholomew's Hospital	M.R.C.S., L.R.C.P. ..	692
L. C. Hayes .. ..	Birmingham University ..	L.R.C.P.Lond., M.B. Bir.	597·5
B. G. Goodwin .. ..	Birmingham University ..	M.R.C.S., L.R.C.P. ..	584
A. S. Cane .. ..	Cambridge and St. Bartholomew's	M.R.C.S., L.R.C.P., B.A.Camb.	563
T. H. Dickson .. ..	Edinburgh University ..	M.B., B.Ch.Edin. ..	547
K. Comyn .. ..	Cambridge and King's College Hospital	M.R.C.S., L.R.C.P., B.C., B.A.Camb.	542
F. R. Laing .. ..	Edinburgh University ..	M.B., B.Ch., Edin. ..	539
A. G. Jones .. ..	Guy's Hospital .. ..	M.R.C.S., L.R.C.P., M.B., B.S.Lond.	536
J. M. Weddell .. ..	Cambridge University ..	M.R.C.S., L.R.C.P., B.A.Camb.	535
P. C. Field .. ..	Bristol and Guy's Hospital	M.R.C.S., L.R.C.P. ..	528
V. P. Hutchinson ..	Guy's Hospital .. ..	M.R.C.S., L.R.C.P. ..	518·5
T. W. Stallybrass ..	Newcastle-on-Tyne .. ..	M.B., B.S., Durham	514·5
H. G. Robertson ..	Glasgow University ..	M.B., B.Ch., B.Sc., Glasgow	513·5
R. C. G. M. Kinkhead ..	Queen's College, Galway ..	M.B., B.Ch., R.V. Ireland	511
C. M. Nicol .. ..	Glasgow University ..	M.B., B.Ch., Glas,	511
H. V. Stanley .. ..	Trinity College, Dublin ..	M.B., B.Ch., B.A. Dublin	511
E. C. Stoney .. ..	Sir P. Dun's Hospital ..	M.B., B.Ch., B.A. Dublin	510·5
A. P. O'Connor .. ..	Catholic University ..	M.B., B.Ch., B.A., R.V. Ireland	507·5
R. M. Davies .. ..	Durham University ..	M.B., B.S., Durham	506
R. Gale .. ..	Glasgow University ..	M.B., B.Ch., Glasgow	505

## OBITUARY NOTICE.

### LIEUTENANT-COLONEL E. J. FAIRLAND.

His numerous friends in the Corps will regret to hear of the death of Lieutenant-Colonel Fairland, which occurred at Bournemouth on August 6, after a long illness.

He entered the Service as Assistant-Surgeon on April 1, 1867, and served in the Abyssinian campaign from September, 1867, to October, 1868, receiving the medal for that campaign. In 1869 he was gazetted Assistant-Surgeon to the 21st Hussars (now

Lancers), and served with them at Umbala and Lucknow till 1873, when the warrant creating a unified medical department was issued. In 1873 he became Staff-Surgeon, Lucknow, which appointment he held till 1880, and received the thanks of the Government of India for duty during the cholera epidemic, and for his successful administration of the lock hospital.

On the occasion of his relinquishing his post at Lucknow the Lieutenant-General expressed his high approval of Surgeon-Major Fairland's work in the following letter by his Assistant-Adjutant-General: "The Lieutenant-General considers it a duty to express the very high opinion he entertains of your admirable services as Staff-Surgeon. He desires me to say that no one could excel you in your estimate of the requirements of duty, nor could anyone bring to them more earnest attention or greater singleness of purpose. It is his especial privilege to be the mouthpiece of the members of this community, ladies as well as gentlemen, not forgetting the many members of the non-commissioned grade, all of whom look to you for skill and kindness with a confidence which speaks for itself."

Subsequently he served at Pachmari, Peshawur, Dover, and Bermuda, and in 1892 was appointed Assistant Professor of Military Medicine at Netley, which appointment he held till January, 1897, when he was compelled, for family reasons, to retire from the Service, greatly to the regret of all who knew and esteemed him for the uniform kindness which characterised his relations with those with whom he came in contact. His clear-headedness and powers of organisation made his retirement a decided loss to the Service, at a time when he was about to enter on those higher administrative duties which would have given greater scope to his special abilities.

After his retirement his energies were devoted to work for which his special abilities for organization made him particularly valuable. He became a Governor of St. Mark's Hospital, was Chairman of Committee of the East India United Service Club from 1901 to 1908, and was a member of the Committee of the Foundling Hospital. On the occasion of his retirement from the chairmanship of the East India United Service Club in 1908 he was presented by the members with a magnificent silver tea and coffee service, "as a mark of their affection and esteem."

The memorial service held at the Foundling Hospital Chapel on August 10 was attended by many friends representative of many branches of the Service, and of all the stations at which he had served, to whom he was endeared by many kindly acts, his invariable generosity, and his real value as a friend.

One can only conclude this inadequate account of a life spent in the service of others by describing it in the words of our motto, "In Arduis Fidelis."

## UNITED SERVICES MEDICAL SOCIETY.

THE next meeting will take place at the Royal Army Medical College, Millbank, S.W., on Wednesday, October 13, 1909, at 8.30 p.m., when a paper will be read by Lieutenant-Colonel P. J. Freyer (Retired Pay), Indian Medical Service.

## INTERNATIONAL GUIDES' ASSOCIATION.

THIS Association supplies medical guides capable of travelling to any part of the world with invalids. Retired medical officers and subordinates are invited to join the Association, which they can do without payment of any fees, on application to the Manager, 20, Victoria Street, Westminster.

## BIRTHS.

MORRIS.—At Ootacamund, South India, on June 1, 1909, the wife of Lieutenant-Colonel A. E. Morris, R.A.M.C., of a son.

STONE.—On 16th August, at 30, Nevers Square, South Kensington, the wife of Major C. A. Stone, R.A.M.C., of a daughter.

## MARRIAGE.

SELBY—GOGGIN.—At St. Oswald Parish Church, Chester, on August 3, by the Rev. Harold Burder, Vicar of the Parish, Captain Robert Selby, R.A.M.C., to Prudence Annie, daughter of the late William Goggin, Esq., of Burton Hill, County Clare, Ireland.

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## DEATH.

THORNHILL.—On August 4, 1909, Honorary Brigade-Surgeon Thomas Allen Thornhill, M.B., retired, aged 75. He entered the Service May 28, 1857; became Surgeon, A.M.D., March 1, 1873; Surgeon-Major, A.M.D., April 1, 1873; retiring with the honorary rank of Brigade-Surgeon October 16, 1880. His war services were as follows: Indian Mutiny, 1857-8; actions of Kalla Nuddecbridge and Shumshabad, siege and fall of Lucknow, attack on Fort Rooyah, action at Alleghunge, and attack and capture of Barielly (slightly wounded). Medal with clasp.

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## EXCHANGES, &c.

*The charge for inserting Notices respecting Exchanges in the Royal Army Medical Corps is 5/- for not more than five lines, which should be forwarded by Cheque or P.O.O., with the notice, to Messrs. G. STREET and CO., Ltd., 8, Serle Street, London, W.C., not later than the 22nd of the month.*

Field Officer coming home by first trooper has very good Charger for Sale. B.C.B. mare, 15 hands. Age 7. First-class ladies' hack. Ridden twice to Kashmir and back; believed sound; or would exchange horses with one similarly situated. Price about Rs. 500. Apply Major Burnside, Mt. Aha.

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	8	0 4 6	0 2 0				
	16	0 7 6	0 3 6				
25	4	0 3 0	0 1 3	4 0	1 3	3 6	0 9
	8	0 5 6	0 2 6				
	16	0 9 6	0 4 6				
50	4	0 4 0	0 1 8	5 0	1 9	4 0	1 0
	8	0 6 9	0 3 2				
	16	0 12 0	0 5 3				
100	4	0 5 6	0 2 9	6 6	3 3	5 6	2 0
	8	0 9 0	0 4 4				
	16	0 16 9	0 6 9				
200	4	0 8 6	0 4 0	9 0	6 3	7 6	4 0
	8	0 13 6	0 6 0				
	16	1 3 6	0 8 9				

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The back outside cover is not available for advertisements.

## Notices.

### EDITORIAL NOTICES.

The Editor will be glad to receive original communications upon professional subjects, travel, and personal experiences, &c. He will also be glad to receive items of news and information regarding matters of interest to the Corps from the various garrisons, districts, and commands at home and abroad.

**All such Communications or Articles accepted and published in the "Journal of the Royal Army Medical Corps" will (unless the Author notified at the time of submission that he reserves the copyright of the Article to himself) become the property of the Library and Journal Committee, who will exercise full copyright powers concerning such Articles.**

Matter intended for the Corps News should reach the Editor not later than the 15th of each month for the following month's issue. Notices of Births, Marriages, and Deaths are inserted free of charge to subscribers and members of the Corps. All these communications should be written upon one side of the paper only; they should by preference be type-written, but, if not, all proper names should be written in capital letters (or printed) to avoid mistakes, and be addressed The Editor, "JOURNAL OF THE ROYAL ARMY MEDICAL CORPS," War Office, Whitehall, London, S.W.

Communications have been received from Surgeon-Captain R. Samut, Captain M. Crauford, Captain A. H. Hayes, Captain J. B. Clarke, Captain J. Tobin, Major F. J. Wade-Brown, Lieutenant-Colonel R. L. R. Macleod, Lieutenant W. E. C. Lunn, Captain A. J. Hull, Captain N. E. Harding, Brevet-Colonel J. E. Edmonds, Lieutenant-Colonel W. G. Macpherson, Captain C. R. S. Bradley, Major B. W. Longhurst, Captain P. G. Easton, Major J. G. McNaught, Major M. P. Corkery, Major R. J. Blackham, Lieutenant-Colonel R. J. S. Simpson.

The following publications have been received :—

*British : Public Health, Journal of the Royal Sanitary Institute, The Transvaal Medical Journal, The Royal Engineers' Journal, The Lancet, St. Bartholomew's Hospital Journal, Army and Navy Gazette, The Hospital, Journal of the Royal United Service Institution, Medical Press and Circular, Guy's Hospital Gazette, The Australasian Medical Gazette, The Journal of Tropical Medicine and Hygiene, Faugh-a-Ballagh Regimental Gazette, The St. Thomas's Hospital Gazette, On the March, The Medical Review, Red Cross and Ambulance News, The Practitioner, Transactions of the Society of Tropical Medicine and Hygiene, Journal of the United Service Institution of India, The All-India Hospital Assistants' Journal, Sleeping Sickness Bureau, The Second Report of the Indigenous Drugs Committee.*

*Foreign : Giornale di Medicina Militare, Japanese Medical Journal, Annales de physiothérapie, U.S. Department of Agriculture, Revista de Sanidad Militar y La Medicina Militar Española, Archives de L'Institut Pasteur de Tunis, Archiv für Schiffs-und Tropen-Hygiene, The Military Surgeon, Archives de Médecine et de Pharmacie Militaires, Le Caducée, Bulletin de l'Institut Pasteur, Archives de Médecine Navale, American Medicine, Deutsche Militärärztliche Zeitschrift, Bulletin of the Johns Hopkins Hospital, Annales d'Hygiène et de Médecine Coloniales, Russian Medical Journal, Der Militärarzt, Annali de Medicina Navale E Coloniale.*



## MANAGER'S NOTICES.

The **JOURNAL OF THE ROYAL ARMY MEDICAL CORPS** is published monthly, six months constituting one volume, a volume commencing on 1st July and 1st January of each year.

The Annual Subscription is £1 (which includes postage), and should commence either on 1st July or 1st January; but if a subscriber wishes to commence at any other month he may do so by paying for the odd months between 1st July and 1st January at the rate of 1s. 8d. (one shilling and eightpence) per copy. (All subscriptions are payable in advance.)

Single copies can be obtained at the rate of 2s. per copy.

The Corps News is also issued separately from the Journal, and can be subscribed for at the rate of 2s. (two shillings) per annum, including postage. Subscriptions should commence from 1st July each year; but if intending subscribers wish to commence from any other month, they may do so by paying for the odd months at the rate of 2d. per copy. (All subscriptions are payable in advance.)

**Officers of the Royal Army Medical Corps possessing Diplomas in Public Health, &c., are kindly requested to register their special qualifications at Headquarters. Letters of complaint are frequently received from officers stating that their special qualifications have not been shown in the Distribution List which is published as a supplement to the Journal in January and July of each year. As, however, the particulars of this list are supplied from official sources, officers are reminded that unless the possession of Diplomas, &c., has been registered at Headquarters, no entry of such qualifications can be recorded in the Distribution List.**

Letters regarding non-delivery of the Journal, or change of address, should be sent to the Hon. Manager, "Journal of the Royal Army Medical Corps," War Office, Whitehall, London, S.W., and reach there not later than the 20th of each month.

It is requested that all Cheques or Postal Orders for Subscriptions to the Journal, Corps News, Reprints, &c., be crossed "Holt & Co.," and made payable to the "Hon. Manager, Journal R.A.M.C.," and not to any individual personally

All communications for the Hon. Manager regarding subscriptions, &c., should be addressed to

THE HON. MANAGER,  
"JOURNAL OF THE ROYAL ARMY MEDICAL CORPS,"  
WAR OFFICE, WHITEHALL, S.W.

# JOURNAL OF THE ROYAL ARMY MEDICAL CORPS.

## Corps News.

OCTOBER, 1909.

### ARMY MEDICAL SERVICE.

Colonel John G. Harwood retires on retired pay, dated September 15, 1909. He entered the Service March 6, 1880; became Surgeon-Major Army Medical Staff, March 6, 1892; Lieutenant-Colonel Royal Army Medical Corps, March 6, 1900; Lieutenant-Colonel, with increased pay under Art. 365 Pay Warrant, October 4, 1902; Colonel, June 29, 1906.

### ROYAL ARMY MEDICAL CORPS.

#### ESTABLISHMENTS.

##### ROYAL ARMY MEDICAL COLLEGE.

Major William S. Harrison, M.B., R.A.M.C., from an Assistant Professor to be a Professor, *vice* Lieutenant-Colonel R. J. S. Simpson, C.M.G., M.B., R.A.M.C., dated August 22, 1909.

Captain James C. Kennedy, M.B., R.A.M.C., to be an Assistant Professor, *vice* Major W. S. Harrison, M.B., dated August 22, 1909.

##### ROYAL ARMY MEDICAL CORPS.

Lieutenant-Colonel Reynolds P. Hetherington, half-pay list, is placed on retired pay, dated September 1, 1909. He entered the Service February 5, 1881; became Surgeon-Major Army Medical Staff, February 5, 1893; Lieutenant-Colonel Royal Army Medical Corps, February 5, 1901; Lieutenant-Colonel, with increased pay under Art. 358, Pay Warrant, July 18, 1906; placed on temporary half-pay on account of ill-health, April 19, 1907. His War Services are as follows: Egyptian Expedition, 1882. Medal, bronze star. Soudan Expedition, 1884-5. Nilo. Clasp. Burma, 1891-2. Irrawaddy and North-eastern Columns. Medal with clasp. South African War, 1899-1902. Operations in the Orange Free State, February to May, 1900. Operations in Cape Colony, South of Orange River, 1899-1900. Operations in Cape Colony, November 30, 1900, to May 31, 1902. Queen's medal and two clasps; King's medal with two clasps.

Lieutenant Alan C. Vidal to be Captain, dated August 29, 1909.

Lieutenant Robert G. Archibald, M.B., to be Captain, dated July 30, 1909.

Quartermaster and Honorary Captain Timothy F. Brake, R.A.M.C., is granted the honorary rank of Major, dated September 5, 1909.

Quartermaster and Honorary Captain John B. Short, R.A.M.C., is granted the honorary rank of Major, dated September 12, 1909.

Quartermaster and Honorary Captain Richard Hawkey is placed on retired pay, dated September 12, 1909.

**ARRIVALS HOME ON LEAVE.**—From Malta: Lieutenant-Colonel J. J. Gerrard and Lieutenant R. W. D. Leslie. From India: Lieutenant-Colonel H. M. Adamson and Captain C. E. W. S. Fawcett. From Gibraltar: Major C. E. P. Fowler. From Khartoum: Captain G. H. Rees. From Egypt: Lieutenant A. E. G. Fraser.

**ARRIVALS HOME ON TRANSFER.**—From South Africa: Colonel A. Peterkin.

**POSTINGS.**—Eastern Command: Lieutenant-Colonel R. Holyoake, Major A. Pearse, and Captain H. V. Bagshawe. London District: Colonel A. Peterkin and Captain J. W. H. Houghton. Irish Command: Captains T. J. Wright and R. L. V. Foster. Aldershot Command: Captain J. W. Langstaff.

Irish Command: Quartermaster and Honorary Captain F. Crookes for duty in the Army Medical Stores, Dublin.

**APPOINTMENTS.**—Major G. Dansey-Browning, Assistant Sanitary Officer, Aldershot; Captains E. Ryan, T. B. Unwin, and F. P. Lauder, Charge of Staff and Families, Aldershot; Captain L. W. Harrison, Pathologist, Rochester Row Hospital.

**TRANSFERS.**—Major G. Dansey-Browning, from Eastern to Aldershot Command; Captain L. W. Harrison, from Eastern to London District; Captain G. S. C. Hayes, from Aldershot to London District; Captain F. P. Lauder, from Southern to Aldershot Command; Captain E. Ryan, from Southern to Aldershot Command; Captain T. B. Unwin, from Northern to Aldershot Command.

**EXCHANGES ON FOREIGN SERVICE ROSTER.**—Lieutenant-Colonel S. C. Philson and Lieutenant-Colonel A. Dodd; Lieutenant-Colonel G. F. H. Marks and Major E. E. Powell; Captain N. J. C. Rutherford and Captain W. Davis; Captain N. J. C. Rutherford and Captain F. McLennan; Lieutenants J. C. L. Hingston and H. H. Blake (as special cases); Lieutenants B. A. Odum and A. T. J. McCreery (as special cases); Major H. A. Bray and Captain C. J. O'Gorman (when latter is promoted Major.)

**EMBARKATIONS.**—For Egypt: Major J. V. Forrest and Lieutenant W. R. O'Farrell. For Malta: Major H. C. French and Captain W. L. Baker. For Gibraltar: Lieutenant-Colonel C. W. Johnson and Major J. E. Brogden. For Somaliland: Lieutenant F. Worthington.

**QUALIFICATIONS.**—Lieutenant F. W. M. Cunningham has obtained the M.D. Edinburgh, 1909.

#### RETIRED PAY APPOINTMENT.

The following retired pay appointments are now vacant: Landguard Fort, Scarborough, Fort Stamford (Plymouth), Ayr, Lincoln.

#### SERVICE ON WEST COAST OF AFRICA.

It has been decided that the tour of service on the West Coast of Africa shall be for three years, made up of two separate periods of one year on the Coast, followed by six months' leave after each year.

#### RESULTS OF EXAMINATION OF MAJORS AND LIEUTENANTS, ROYAL ARMY MEDICAL CORPS.

The following results of examinations are notified for general information:—

Passed in Military Law for the rank of Lieutenant-Colonel: Captain E. A. Bourke (75 per cent.).

Passed in (h) i for rank of Captain: A. C. Vidal; T. T. H. Robinson, M.B.; C. T. Edmunds.

Passed in (h) ii and iii for the rank of Captain: J. C. Hart, M.B. (80 per cent.).§

§ Special Certificate.

#### LIST OF TOUR-EXPIRED OFFICERS OF THE ROYAL ARMY MEDICAL CORPS IN INDIA DETAILED TO EMBARK FOR ENGLAND IN THE SEVERAL TRANSPORTS TO WHICH THEY HAVE BEEN ALLOTTED DURING THE TROOPING SEASON, 1909-10.

1st Transport "Robilla," October 14, 1909, from Bombay: Lieutenant-Colonel J. R. Forrest; Major R. C. T. Thacker; Major E. S. Clarke; Major E. A. Burnside; Captain W. McD. MacDowall; Captain B. G. Patch.

2nd Transport "Dongola," October 27, 1909, from Bombay (leaves Aden November 1, 1909): Lieutenant-Colonel C. T. Blackwell; Major J. W. Jennings; Captain S. L. Pallant; Captain F. J. Turner; Captain R. H. MacNicol.

3rd Transport "Plassy" (as an ordinary transport), November 5, 1909, from Bombay: Lieutenant-Colonel F. J. Jencken; Lieutenant F. S. LeQuesne; Major W. E. Hudleston; Major F. Kiddle; Major H. E. Winter; Major H. W. K. Read; Captain W. F. H. Vaughan.

4th Transport "Rohilla," December 10, 1909, from Karachi: Lieutenant-Colonel A. R. Aldridge; Captain J. D. Richmond; Captain H. Harding; Captain R. B. Hole; Captain M. F. Grant.

5th Transport "Dongola," December 31, 1909, from Karachi. Lieutenant-Colonel F. P. Nicholls; Lieutenant-Colonel H. A. Haines; Lieutenant-Colonel D. M. O'Callaghan; Major B. J. Inniss; Captain S. M. W. Meadows; Captain M. D. Ahern.

6th Transport "Plassy" (Hospital Ship), January 11, 1910, from Bombay: Lieutenant-Colonel G. Wilson; Lieutenant-Colonel H. D. Rowan; Captain G. B. Carter; Captain H. C. Hildreth; Captain A. C. Osburn; Captain W. Wiley; Captain A. L. Otway.

7th Transport "Dufferin," January 28, 1910, from Bombay (leaves Aden February 2, 1910): Lieutenant-Colonel H. Cocks; Lieutenant-Colonel H. P. G. Elkington; Major C. Dalton; Captain S. O. Hall; Captain J. Fairbairn; Captain A. R. Arthur; Captain D. P. Watson.

8th Transport "Rewa," February 2, 1910, from Karachi: Lieutenant-Colonel W. T. Swan; Major J. B. Anderson; Major K. M. Cameron; Captain R. T. Collins; Captain A. J. Hull.

9th Transport "Rohilla," February 11, 1910, from Karachi: Lieutenant-Colonel F. W. Gordon Hall; Major J. Grech; Captain M. C. Wetherell; Captain J. H. Douglass.

10th Transport "Dongola," March 2, 1910, from Bombay: Lieutenant-Colonel J. R. Stuart; Lieutenant-Colonel P. C. H. Gordon; Major A. J. Luther; Major St. J. B. Killery; Captain T. E. Harty; Captain D. P. Johnstone; Captain R. R. Lewis.

11th Transport "Plassy" (Hospital Ship), March 11, 1910, from Bombay (leaves Aden March 16, 1910): Lieutenant-Colonel W. W. Pike; Lieutenant-Colonel T. McDermott; Captain J. A. Turnbull; Captain F. J. Garland; Captain F. M. M. Ommanney; Captain F. H. Noke; Captain G. E. Cathcart.

#### MEMORANDUM.

##### THE FOLLOWING LIST SHOWS THE POSITION OF OFFICERS ON THE ROSTER FOR SERVICE ABROAD.

Officers who have been nominated for service abroad during the coming season are excluded. Those holding appointments for fixed periods are indicated by the dates of expiry of the appointment.

*Selected Lieutenant-Colonels.*—Lieut.-Cols. J. M. Irwin (1.6.10), T. W. O'H. Hamilton (2.4.10), W. L. Reade (24.10.10); Bt.-Col. and Lieut.-Col. F. J. Lambkin (2.4.10); Lieut.-Cols. R. P. Bond (4.1.11), R. D. Hodson (retires Dec., 1909), W. Dick (3.2.11), R. Kirkpatrick, C.M.G. (1.9.11), S. Townsend (retires Feb., 1911), R. Porter, R. R. H. Moore (9.3.10), D. V. O'Connell (23.4.12), C. R. Tyrrell, A. Dodd, F. H. M. Burton, T. P. Woodhouse (22.10.11), H. H. Johnston, C.B. (14.4.12), R. E. R. Morse (1.3.12), J. H. A. Rhodes, F. H. Treherne (15.3.12), W. Heffernan, T. E. Noding (24.4.12), R. H. S. Sawyer, R. J. S. Simpson, C.M.G.

*Lieutenant-Colonels and Majors.*—Lieut.-Col. Sir W. B. Leishman (31.1.10); Majors C. G. Spencer (31.7.10), W. S. Harrison (22.9.13); Lieut.-Cols. J. R. Yourdi (retires Feb., 1910), W. B. Day (retires May, 1910); Majors G. A. T. Bray (20.8.10), G. B. Stanistreet (7.9.10); Lieut.-Col. R. J. C. Cottell (16.8.11); Majors T. B. Beach (4.4.10), G. A. Moore (23.12.10), W. W. Beveridge, D.S.O. (17.6.10), E. G. Browne (30.9.10); Lieut.-Col. J. H. Curtis (retires May, 1910); Major H. L. W. Norrington (23.9.10); Lieut.-Cols. C. H. Burchaell (7.1.11), R. J. Windle (30.9.10); Major E. T. F. Birrell (18.8.12); Lieut.-Col. C. W. S. Magrath (retires Feb., 1911); Majors G. S. McLoughlin, D.S.O. (1.9.11), H. G. F. Stallard (10.11.10), J. H. Rivers; Lieut.-Cols. C. H. Melville (17.9.12), E. Eckersley (20.1.13); Majors G. E. F. Stammers (12.4.10), H. J. M. Buist, D.S.O. (30.4.10), C. E. G. Stalkartt, A. W. N. Bowen, H. S. Thurston; Lieut.-Cols. J. B. W. Buchanan, G. W. Brazier-Creagh, R. W. Wright (14.3.10); Majors F. S. Penny, W. H. S. Nickerson, V.C. (1.10.10); Lieut.-Col. R. H. Hall; Majors J. J. C. Watson, C.I.E., A. H. Morris (9.7.10), C. F. Wanhill (27.7.11), E. Brodribb (15.8.11), S. H. Fairrie, C. T. Samman; Lieut.-Col. H. W. Austin; Majors G. T. Rawnsley, J. McD. McCarthy (28.12.10), C. J. Healy; Lieut.-Cols. C. L. Josling (10.3.10), C. S. Sparkes; Major C. B. Martin; Lieut.-Col. R. G. Hanley; Majors R. J. W. Mawhinny, S. F. St. D. Green (24.10.10); Lieut.-Col. S. G. Allen (26.11.10); Majors L. Way, R. C. Lewis; Lieut.-Cols. C. J. Macdonald, W. Turner (17.12.10), C. C. Reilly (7.12.10); Majors F. G. Faichnie, F. M. Mangin (31.1.11), H. E. Staddon; Lieut.-Col. M. W. Russell (22.8.13); Majors W. L. Gray, K. B. Barnett, N. Marder; Lieut.-Col. F. S.

Heuston, C.M.G. (11.11.11); Majors G. W. Tate, D. Lawson, W. H. Horrocks (17.9.11), B. H. Scott (1.5.11), G. Dansey-Browning; Lieut.-Col. G. D. Hunter, D.S.O. (11.11.11); Major E. E. Powell; Lieut.-Col. H. M. Sloggett (26.10.11); Majors C. C. Fleming, D.S.O. (13.6.13), H. W. H. O'Reilly, L. Addams Williams, B. W. Longhurst; Lieut.-Cols. J. J. Russell, J. Fallon; Major H. A. Bray; Lieut.-Col. F. R. Newland (6.12.12); Majors W. Tibbits, E. H. Condon, C. B. Lawson (6.1.12), A. P. Blenkinsop (17.3.12), T. J. Lenehan, C. W. Profeit; Lieut.-Col. F. W. C. Jones (31.12.11); Majors L. A. Mitchell, W. J. Taylor; Lieut.-Col. D. M. Saunders; Majors N. Tyacke, A. W. Hooper, D.S.O., E. McK. Williams, E. C. Hayes, T. P. Jones (18.8.12), S. G. Moores, G. S. Mansfield; Lieut.-Col. C. A. Lane (28.12.11); Major J. P. Silver; Lieut.-Cols. M. L. Hearn (20.1.12), M. J. Sexton; Majors W. G. Beyts, W. T. Mould, T. H. M. Clarke, C.M.G., D.S.O. (29.8.12); Lieut.-Col. N. C. Ferguson, C.M.G.; Major S. L. Cummins; Lieut.-Col. J. Donaldson; Major J. C. Morgan; Lieut.-Col. T. G. Lavie; Major C. M. Fleury; Lieut.-Col. J. B. Wilson (18.2.12); Major F. W. Hardy; Lieut.-Col. J. H. Daly; Majors E. M. Williams (6.3.12), C. H. Hale, D.S.O.; Lieut.-Col. J. J. C. Donnet; Major A. Pearse; Lieut.-Col. J. Will; Majors A. E. Milner, F. R. Buswell, F. W. Begbie, W. Nallaran; Lieut.-Col. M. O'Halloran; Major W. A. Ward; Lieut.-Col. R. Holyoake; Major J. H. E. Austin.

*Captains.*—Captains J. M. Sloan (15.6.11), R. H. Lloyd (15.6.11), H. S. Roch (15.6.11), E. P. Connolly (15.6.11), W. A. Woodside (15.6.11), V. J. Crawford (25.10.10), F. Ashe (3.9.10), G. G. Delap, D.S.O. (15.6.12), E. Bennett (15.6.11), F. A. Stephens (15.6.11), J. Tobin (1.12.11), J. J. W. Prescott, D.S.O. (27.11.11), H. P. W. Barrow (12.10.10), J. A. Hartigan (17.1.11), A. D. Jameson (20.8.10), F. M. Parry (1.11.11), F. W. Lambelle, C. E. Fleming, H. F. Shea, J. W. West, S. M. Adye-Curran, A. W. A. Irwin, A. E. Thorp, C. H. Straton (17.10.11), E. P. Sewell (22.9.11), A. C. Adderley, R. N. Woodley, L. Wood (30.10.11), H. E. J. A. Howley, J. G. Foster, G. F. Rugg, W. B. Winkfield, W. B. Fry, C. H. Furnivall, R. L. Ronayne, J. W. Leake, E. G. Ffrench, G. S. C. Hayes, R. L. Popham, L. N. Lloyd, D.S.O. (1.11.11), J. C. Kennedy (22.8.13), T. J. Potter, H. B. G. Walton, J. H. Robinson (30.9.11), J. T. Johnson, R. V. Cowey (16.9.11), R. N. Hunt, W. M. McLoughlin, P. H. Henderson, J. Dorgan, A. C. Duffey, W. J. Waters, E. E. Parkes, A. W. Gibson, C. R. Evans, J. B. Clarke, B. S. Bartlett, P. C. Douglass, T. B. Unwin, J. S. Bostock, A. R. O'Flaherty, A. R. Greenwood, P. G. Hyde, A. A. Seeds, J. P. J. Murphy, H. A. Bransbury, R. C. Wilson, A. H. McN. Mitchell, J. Cowan, G. Baillie, B. B. Burke, F. G. Fitzgerald, H. B. Connell, W. R. P. Goodwin (4.9.10), G. H. Goddard, T. Biggam, R. F. M. Fawcett, L. F. F. Winslow, R. S. H. Fuhr, D.S.O. (13.8.12), A. J. Williamson, M. W. Falkner, W. J. P. Adye-Curran, W. S. Crosthwait, J. E. Hodgson, E. Ryan, H. Rogers, L. W. Harrison, M. F. Foulds, H. W. Long, C. C. Cumming, A. W. Sampey, M. G. Winder, L. L. G. Thorpe, F. MacLennan, F. E. Rowan Robinson, J. L. Jones, A. N. Fraser (31.8.11), J. H. Duguid, E. S. Worthington, W. M. H. Spiller, H. H. Kiddle, N. H. Ross (29.8.11), F. Harvey (28.9.11), L. Cotterill, A. McMunn, J. H. R. Winder, A. J. W. Wells, J. F. Whelan, T. F. Ritchie, A. L. Scott, W. J. S. Harvey, H. G. Pinches, J. E. H. Gatt, A. O. B. Wroughton, H. E. M. Douglas, V.C., D.S.O., R. Storrs, J. M. H. Conway, D. O. Hyde, F. S. Walker, W. D. C. Kelly, H. D. Packer, H. V. Bagsshawe, R. J. Franklin, F. A. H. Clarke, F. W. W. Dawson, R. B. Ainsworth, W. W. Browne, A. H. Hayes, N. D. Walker, N. E. J. Harding, S. B. Smith, C. R. Millar, A. T. Frost, C. Ryley, R. M. Ranking, D. E. Curmo, G. A. K. H. Reed, C. H. Carr, R. Rutherford, J. F. Martin, P. G. Easton, C. S. Smith, H. A. Davidson, C. A. J. A. Balck, G. J. Houghton, E. B. Knox, G. R. Painton, P. Power, H. W. Russell, G. S. Wallace, T. S. Coates, H. J. Crossley, D. L. Harding, J. McKenzie, W. L. Steele, M. C. Beatty, W. C. Croly, D. Ahern, W. F. Tyndale, C.M.G., H. T. Stack, C. D. Myles, R. H. Bridges, J. G. Bell, A. F. Weston, J. W. H. Houghton, F. P. Lauder, J. W. Langstaff, T. S. Dudding, R. C. Wilmot, E. M. Pennefather, J. A. W. Webster, H. B. Kelly, M. G. Dill, J. B. Maldon, D. G. Carmichael, B. H. V. Dunbar, J. C. G. Carmichael, R. J. B. Buchanan, A. E. B. Wood, J. M. M. Crawford, C. Bramhall, P. Davidson, D.S.O., H. H. J. Fawcett, J. Powell, T. J. Wright, R. L. V. Foster, F. J. Brakenridge.

*Quartermasters.*—Hon. Capt. G. H. Painton (retires July, 1910); Hon. Lieuts. F. Bruce (retires February, 1910), F. W. Hall, J. Attwood; Hon. Capt. H. G. Hasell; Hon. Lieut. W. J. C. Talbot; Hon. Capt. J. C. B. Whitehorn (retires February, 1911); Hon. Lieut. H. J. F. Audus; Hon. Major J. H. W. Beach; Hon. Lieut. R. R. Cowan; Hon. Major A. Bruce (1.10.11); Hon. Lieut. H. W. Glover; Hon. Capt. F. Crookes (—10.12); Hon. Lieuts. J. McClay, A. Lunney, A. Wheeler, J. Watkins; Hon. Major T. F. Brake; Hon. Lieuts. H. P. Wakefield, J. Gillman, E. P. Moss, T. Exton; Hon. Majors J. B. Short, E. Lines (retires May, 1910); Hon. Lieuts. R. Scott, A. Wilson,

W. N. Archibald, H. Woolley; Hon. Capt. G. L. Allen; Hon. Lieuts. G. F. Short, W. G. Holway; Hon. Major J. Hirst (retires February, 1911); Hon. Capt. H. S. Brook; Hon. Lieut. W. Duncan.

#### PHYSICAL TRAINING, &c.

The following is the approved syllabus of the course of instruction in the subject of "Physical Training, including the Clothing and Food of the Soldier," which has been added to the list of special subjects which may be taken by Captains for promotion to the rank of Major.

The theoretical part of the course will be given by the Professor of Hygiene in the Royal Army Medical College; the practical part will be given by Dr. Pembrey, at Guy's Hospital, by the Professor of Hygiene, and by a Military Instructor in a gymnasium for troops in London.

#### (1) PHYSIOLOGY OF THE SOLDIER.

The nature of the raw material.

Growth and development of young male adults from 18 to 25, with special reference to osseous, circulatory, and respiratory systems.

Effect of under-feeding and other unfavourable conditions before enlistment.

Physics and physiology of muscular work. Effect of muscular work on the chief systems of the body, especially on deep and surface temperature of the body.

Interaction of surrounding conditions, especially temperature and moisture.

Necessity and object of physical training.

Progressive training. Importance of attention to individual differences.

Therapeutic use of training on special ailments or injuries. Restoration of general condition in soldier after discharge from hospital or detention. Importance of individual attention in these cases.

Special requirements of different branches of the service. Effect of special arms on special systems, *e.g.*, Garrison Artillery and aneurism.

Training of soldier in the ranks.

Different forms of training. Formal exercises with or without apparatus, games, sports, and manual labour. Relative advantages and disadvantages, and spheres of these.

Different systems of training in Army and Navy, including a brief reference to conditions in foreign armies. Criticism of manuals, official and otherwise.

#### *Overwork.*

Signs of acute overwork.

Fatigue, its causes and nature. Effect on muscular, nervous, and other systems.

Chronic overwork, nature and effects.

Cardiac disorder. Effects of tobacco during training, especially of young soldier.

#### *Marching.*

Marching. Chief ultimate object of training of infantry soldier; its effect.

Ordinary marches. Forced marches. Historical marches.

Loss of moisture from body on the march; its significance.

Water on the march. Water discipline. Influence and effect of load carried. Proportion load should bear to weight of man. Effect of distribution of load. Halts; their effect. Considerations affecting their number and duration. Manœuvres.

#### (2) CLOTHING AND EQUIPMENT.

Clothing, its object and effect.

Deep and surface temperature of body; how affected by clothing. Skin and its functions; how effected by clothing.

Relation of clothing to surrounding conditions of temperature and humidity.

Material and pattern of clothes worn. Bad uniforms.

Relation of skin to kidneys, in connection with excretion of water.

Influence of exercise. Albuminuria.

Effects of improper clothing. Heat-stroke, chills, &c.

Head-dress. Objects. Different forms of materials used.

Foreign services.

Effect of improper head-dress. Sunstroke. Effect of light and heat.

Foot-gear. Principles of boot-making. Foreign foot-gears.

Socks, foot-cloths, &c.

Effects of improper foot-gear. Sore feet. Hygiene of the foot. Equipment, its object and necessity.

Essential principles of a good equipment.

Two kinds—fighting equipment and living equipment.

Necessity of keeping these separate.

Distribution of fighting equipment on body; how affected by tactical considerations.

Distribution of living equipment. Amount of this necessary.

Historical instances.

Discussion of our own and foreign equipments.

Historical sketch of prior attempts to solve question.

Water-bottles. Size. Material. How carried.

Review of foreign and historical bottles.

Mess tins. Pattern and material. Foreign arrangements.

#### *Food.*

Physiological principles of dietetics.

The exchange of material of men under different conditions.

Influence of age, work, and climate.

Consideration of the relative values of foods.

The need of variety. Individual likes and dislikes; their physiological significance.

Calculation of the energy value of diets. The limitations of such a calculation as a guide to a good diet.

Natural foods. Preserved foods.

Peace rations. War rations. Emergency rations.

Alcohol.

System of messing.

#### *Practical Work.*

A practical course of instruction at a gymnasium.

Detection of signs of bad training or over-training in teacher and pupil.

Influence of exercises upon the circulation, respiration, and nervous system.

Investigation of influence of clothing upon deep and surface temperature of body, and output of moisture under different conditions.

Examination of clothing and equipment.

Examination of men after a march or physical exercise.

Some special piece of research work in military physiology.

#### *Bibliography and Practical Course.*

The Professor of Hygiene will advise candidates on the literature to be consulted, &c.

**NOTES FROM WALES.**—Career of No. 13077 Private C. Thomas, late Royal Army Medical Corps. (Extract from the *South Wales Argus*) :—

“Charlie Thomas is the light-weight boxing and wrestling amateur champion of Wales, and was born at Newport in February, 1881. He stands 5 feet 5 inches in height, and weighs 9 st. 9 lb. His physical development renders him, when in wrestling costume, a conspicuous figure, even among athletes. He commenced boxing in 1900, after he had joined the Royal Army Medical Corps, and was bound for the scene of the Boer War on board the R.M.S. ‘Saxon.’ Thomas entered for the open boxing competition, and proved himself to be a natural fighter, for he defeated every man he met, and on reaching Cape Town he was presented with a handsome silver loving cup by Sir Henry Juta, K.C. After war duties were over and peace was declared, the Royal Army Medical Corps held sports in Pretoria, and included a middle-weight boxing competition. Thomas entered, and after winning his way up through the series, he defeated Private Butler in the final in one round. Returning to England on board H.M.T.S. ‘Dunera,’ he entered the light-weight open competition in mid-ocean, and knocked out Private McPherson, West Yorks Regiment, in the semi-final in half a minute, and a private of the 16th Lancers in the final in the third round, after a terribly hard fight. On reaching England he was transferred to the Army Reserve, and received the King’s and Queen’s medals, with five bars, for active service in South Africa. Thomas returned to Newport in August, 1903, and soon afterwards started to learn wrestling under Mr. Peter Wright. He has proved to be the finest pupil Mr. Wright has taught, and he holds an undefeated record up to date. In 1904 he entered for the Welsh Championship Wrestling Belt. He first met Owen Harris (Brynmawr), at Cardiff, and the result showed that mat work is not without a certain amount of danger, for Harris, who was a stone heavier than Thomas, was forced to retire from the contest with three ribs fractured. After three of the hardest wrestling bouts in the competition, Charlie received a bye in the next series, and then met Dai Rees (Llansamlet), the recognised light-weight champion of Wales. Rees lost the first bout by applying the strangle hold.

The two next bouts went the full twenty minutes without a fall, but as Thomas was on the offensive the whole time he received the referee's award. Turning his attention again to boxing, he won a large silver cup in a 10-stone boxing competition at Taylor's Pavilion, Newport, 1905. At Yarmouth, in May, 1906, he wrestled a drawn bout with Bartoletti, the Italian amateur champion, and defeated him later the same year at the



CHARLIE THOMAS (Newport), 10-stone Champion of Wales, 1904 to 1908.

Market Hall, Aberdare. At the same hall Thomas won a 10-stone boxing competition, defeating Instructor Lewis (Aberaman S.P.C.) in half a round in the final. In 1906 Thomas had a special boxing contest with Charlie Faulkes, of Newport, at Taylor's Pavilion, Pill. Thomas knocked his man out in the second round, and received a gold medal. He also received a special gold medal for wrestling Tom Taylor (withstanding a fall) on the same night.

"One feat of his deserves special mention. After winning the first series of a boxing competition at the Wonderland, London, the same evening he wrestled Peter Gotz,



the light-weight champion of the world, and withstood him for twelve and a half minutes. Gotz has won three world's championship belts. Last year (1908) Thomas won two open 10-stone wrestling competitions at Pontypridd Sports, and won the Welsh Amateur Wrestling Championship on Whit Monday, by defeating Harry Symonds, of Cardiff, in the final. He withstood Arthur Norton, 9-stone champion of the world, for thirty minutes at the Palace, Cardiff, and was presented with a handsome silver cup by the management. He has defeated Harry Symonds in a special match at Eglwysilan and Senghenydd. A couple of weeks ago he won a special cup from Peter Gotz, at Blaina, for staying the longest time for any amateur. His services at charitable entertainments have been very largely in request."

**NOTES FROM MALTA.**—Captain Gibbon writes:—

"*Cricket.*—Since the last notes were written we have played four matches, winning two and losing two. We played the detachment of the 2nd Devons on July 6, 7, and 8, and by beating them we qualified to meet the Royal Engineers in the semi-final of the Governor's Cup. Against the Devons mention must be made of the bowling of Lance-Corporal Cowx in the first innings, when he took nine wickets for 22 runs, this practically putting us in a winning position for the rest of the match. In our match against the Royal Engineers on the 19th and 20th it would be well to draw a veil over the whole proceedings. We got well beaten by an innings and runs as well, and we richly deserved it; our fielding was a disgrace, and the number of catches missed was beyond count. After this defeat we played H.M.S. 'Egmont' on the 24th, and won easily, and on the 31st we met the Devons again in a friendly match, the remainder of the regiment having come in from Crete, and were defeated in a very close match by 8 runs. Interest now mainly centres round the Soldiers' Cup, in the second round of which we meet the Royal Garrison Artillery, Western District."

Captain Anderson writes (under date September 9): "Summer is over. San Lorenzo's day, August 12, true to local tradition, was stifling, and followed by several oppressive nights until the promised rain came on St. Bartholomew's day. A storm occurred, as usual, early in September, and left the air cool and invigorating."

"The approaching trooping season has been heralded by a few tentative offers of exchange, showing that the advantages of Malta are becoming known, although still underestimated."

"In emptying the donjons of the Valletta Hospital an antique oar and boat-hook were discovered, and are now in charge of the Forest Detachment, who are the proud possessors of the only Royal Army Medical Corps rowing boat. The Mediterranean Skiff Club have had several good races during the last two months. On one occasion when 'Valletta,' sailed by the Commodore, a well-known Admiral, with a long lead appeared certain of winning, 'Midget,' sailed by Captain Maughan, surprised the spectators by coming up and finishing first."

"It may interest travellers who are likely to call at Malta to know that the unique neolithic hypogeum of Hal Safieni at Paola is very accessible and should be seen, although not yet noticed in guide books. Fresh chambers are gradually being cleared, and right patellæ are selected for the purpose of estimating the number of bodies. In about one cubic yard of soil, 140 of these bones were found. The work is being done most carefully in a sympathetic spirit."

"The cricket season is almost over, and it is expected that averages will soon be announced."

**NOTES FROM WYNBERG.**—Serjeant-Major C. W. Kinsella, R.A.M.C., writes: "On August 2, No. 22 Company, Royal Army Medical Corps, paraded at Wynberg in Review Order under Major D. J. Collins, Officer Commanding, to witness the presentation of the medal for long service and good conduct to No. 8921 Corporal J. Critchley."

"Major-General H. J. Scobell, C.V.O., C.B., who was accompanied by Colonel E. S. Bulfin, A.G. and Q.M.G., and Captain L. Darrel, 1st Life Guards, A.D.C., arrived about 12.45 p.m., and was received by Major W. E. Hardy, Acting Administrative Medical Officer, the other officers on parade being Major D. J. Collins, Major and Quartermaster G. Merritt, Captain P. J. Hanafin, and Lieutenant and Quartermaster J. B. Connolly."

"Addressing the Company, the Major-General congratulated Corporal Critchley on attaining this medal, and also on his having been embodied in one of Kipling's works for his good work during the war. He (the Major-General) hoped that those present in the ranks would emulate Corporal Critchley's good example."

"The General then visited the wards and expressed much satisfaction at the appearance of the hospital.

"The officers of the Royal Army Medical Corps subsequently lunched with the officers of the 1st King's Own Yorkshire Light Infantry, it being the anniversary of Minden Day, H.E. the Acting Administrator (Sir W. Hely-Hutchison) and Lady Hely-Hutchison and a distinguished company being present.

"Serjeant-Major Kinsella has been granted an extension to the age-limit (45 years) of his rank, May, 1911.

"A continuance of wet weather has debarred our hockey team from continuing the list of fixtures, and at the time of writing there seems little prospect of a change in the meteorological conditions, the tail end of the gale which wrecked the ill-fated 'Maori' not yet having exhausted itself.

"The Secretary of the Royal Sanitary Institute notifies that at a meeting held on July 5, Serjeant-Major Kinsella was elected an Associate."

"A Garrison Concert, organised by Serjeant-Major Kinsella, in conjunction with Bandmaster Simpson, of the 1st King's Own Yorkshire Light Infantry, was held in Wynberg Camp on Monday, September 6, of which the local papers say:—

"*Concert at Wynberg.*—An invitation concert was held at Wynberg Camp on Monday night last, the string band of the 1st King's Own Yorkshire Light Infantry (by permission of Major Withycombe and the officers of the Regiment) forming the orchestra and contributing some pleasing selections under the baton of Mr. H. W. Simpson. Miss M. Morris was heard to advantage in the "Jewel Song" ("Faust") and "Oh, Flower of all the World," while Miss Miriam Merritt gave fine renderings of "Enchantress" and "God keep thee pure." Mr. Paul Alberto contributed a fine performance of "Land of Hope and Glory" (with orchestra), with "Thy Beaming Eyes" as an encore, and, later, gave some excellent selections at the piano, his rendering of "Thora" being enthusiastically received. Messrs. F. R. Day and W. Armstrong were responsible for the very efficient rendering of "The Carnival," in the first instance, and "Take a Pair of Sparkling Eyes" ("Gondoliers"), and "Pearl of Sweet Ceylon" ("Cingalee"), in the latter. The concerted pieces: Trio, "Turn on, Old Time" (by Miss Merritt, Messrs. Day and Serjeant-Major Kinsella), and the duets, "I am the King of Spain" (Messrs. Day and Serjeant-Major Kinsella) and "Tell me, Pretty Maiden" ("Floradora"), by Major and Miss Merritt, lent an agreeable variety, and were exceptionally well done to orchestral accompaniment. The comic element was in the capable hands of Messrs. Wilson, Gutteridge, and Stevens, who caused much amusement. Professor Carl Wallace gave an excellent display of sleight-of-hand and conjuring tricks. Mr. E. Davies, with Misses Boraime and Gover, proved efficient accompanists, and the arrangements were excellently carried out by Serjeant-Major C. W. Kinsella.

"Amongst those present were: Major and Mrs. Withycombe, Major and Mrs. Hardy, Major and Mrs. Collins, Major, Mrs. and Miss Merritt, Captain and Mrs. Conolly, Lieutenant and Mrs. Conolly, Matron Miss Hutton-Potts and the nursing sisters, and the officers of the King's Own Yorkshire Light Infantry, Revs. De Lisle, Fathers John O'Reilly and Glynn."

"Colonel G. W. Robinson arrives on September 15, on assuming the post of Assistant Medical Officer of the Cape and Orange River Colonies.

"Quartermaster-Serjeant Tite has been transferred from Pretoria as clerk to the new Assistant Medical Officer.

**NOTES FROM SIMLA.**—Lieutenant-Colonel R. S. F. Henderson, R.A.M.C., writes as follows (dated July 15, 1909):—

"*Appointments.*—Colonel H. J. R. Moberly has been appointed permanently as Principal Medical Officer, Bangalore and Southern Brigades, with effect from July 1, 1909, *vice* Colonel O. Todd, retired.

"*Leave.*—Following officers have been granted extension of medical certificate leave, expired, India:—

"Major M. M. Rattray, from August 1, 1909, to January 31, 1910.

"Captain G. H. Richard, from July 26, 1909, to October 25, 1909.

"*Postings.*—Officers coming out from England during the ensuing trooping season in relief of tour expired officers are posted to Divisions as shown in the accompanying list, which, is however, liable to any alterations the exigencies of the Service may require."

**NOMINAL ROLL OF ROYAL ARMY MEDICAL CORPS OFFICERS ARRIVING IN INDIA FROM  
ENGLAND DURING THE TROOPING SEASON OF 1909-10, SHOWING THE DIVISIONS  
TO WHICH THEY HAVE BEEN ALLOTTED.**

**NORTHERN ARMY.**

Rank	Name	Division to which posted	Remarks
Lieut.-Col.	S. Townsend .. ..	8th ..	—
"	W. G. Macpherson, C.M.G. ..	4th ..	To command S.H., Quetta.
"	R. H. Firth .. ..	A. H. Qrs. ..	—
"	A. Dodd .. ..	1st ..	To command S.H., Nowshera.
"	S. R. Wills .. ..	7th ..	—
"	W. B. Day .. ..	3rd ..	To command S.H., Ferozepore.
"	H. Carr .. ..	3rd ..	" " Jullundur.
"	J. S. Davidson .. ..	8th ..	" " Allahabad.
"	J. V. Salvage .. ..	7th ..	—
"	T. H. F. Clarkson .. ..	1st ..	—
Major	W. C. Poole .. ..	2nd ..	—
"	J. Ritchie .. ..	3rd ..	—
"	E. M. Hassard .. ..	3rd ..	—
"	J. Thomson .. ..	7th ..	—
"	E. E. Powell .. ..	2nd ..	—
"	J. D. Alexander .. ..	7th ..	—
"	H. A. Bray .. ..	7th ..	—
"	R. F. E. Austin .. ..	3rd ..	—
"	L. F. Smith .. ..	1st ..	—
Captain	C. W. Mainprize .. ..	2nd ..	—
"	F. J. Palmer .. ..	7th ..	—
"	R. A. Cunningham .. ..	7th ..	—
"	E. G. Ford .. ..	2nd ..	—
"	R. F. Ellery .. ..	8th ..	—
"	L. M. Purser .. ..	7th ..	—
Lieutenant	W. R. Galwey .. ..	3rd ..	—
"	A. Fortescue .. ..	7th ..	—
"	F. H. M. Chapman .. ..	8th ..	—
"	H. S. Dickson .. ..	1st ..	—
"	F. J. Stuart .. ..	7th ..	—
"	J. B. Hanafin .. ..	7th ..	—
"	J. A. Renshaw .. ..	1st ..	—
"	R. de V. King .. ..	3rd ..	—
"	R. G. S. Gregg .. ..	8th ..	—
"	H. W. Carson .. ..	2nd ..	—
"	F. T. Dowling .. ..	1st ..	—
"	C. P. O'Brien-Butler .. ..	6th ..	—
"	J. F. Grant .. ..	8th ..	—
"	A. L. Foster .. ..	3rd ..	—
"	T. S. Eves .. ..	8th ..	—
"	G. Petit .. ..	8th ..	—
"	G. F. Dawson .. ..	7th ..	—
"	T. M. C. Phillips .. ..	8th ..	—

**SOUTHERN ARMY.**

Lieut.-Col.	C. E. Nichol, D.S.O. ..	Burma ..	To command S.H., Rangoon.
"	A. T. I. Lilly .. ..	6th ..	" " Belgaum.
"	G. G. Adams .. ..	4th ..	—
"	H. E. Cree .. ..	5th ..	To command S.H., Jhansi.
"	R. H. Penton, D.S.O. ..	6th ..	—
Major	C. R. Elliott .. ..	5th ..	—
"	O. L. Robinson .. ..	9th ..	—
"	S. J. C. P. Perry .. ..	Burma ..	—
"	H. W. Grattan .. ..	4th ..	—
Captain	H. O. B. Browne-Mason ..	6th ..	—
"	M. M. Lowsley .. ..	9th ..	—

Rank	Name	Division to which posted	Remarks
Captain	G. J. S. Archer .. ..	9th ..	—
„	E. P. Hewitt .. ..	9th ..	—
„	H. Simson .. ..	6th ..	—
„	J. H. R. Bond .. ..	5th ..	—
„	H. C. R. Hime .. ..	Burma ..	—
„	J. G. Churton .. ..	1st ..	Specialist in Operative Surgery.
„	R. T. Brown .. ..	Burma ..	—
Lieutenant	M. P. Leaby .. ..	6th ..	—
„	W. G. Aviss .. ..	4th ..	—
„	H. Gibson .. ..	5th ..	—
„	C. A. T. Conyngham .. ..	4th ..	—
„	D. B. McGrigor .. ..	4th ..	—
„	W. A. Spong .. ..	5th ..	—
„	H. P. Hart .. ..	Burma ..	—
„	R. F. O. T. Dickinson .. ..	5th ..	—
„	J. C. L. Hingston .. ..	5th ..	—
„	A. E. B. Jones .. ..	Burma ..	—
„	B. A. Odium .. ..	4th ..	—
„	A. Hendry .. ..	5th ..	—
„	J. R. Lloyd .. ..	5th ..	—
„	W. J. Dunn .. ..	6th ..	—
„	F. B. Dalgleish .. ..	5th ..	—
„	M. Leckie .. ..	5th ..	—
„	S. G. Walker .. ..	6th ..	—
„	F. M. Hewson .. ..	4th ..	—
„	C. M. Rigby .. ..	9th ..	—
„	L. Murphy .. ..	9th ..	—
„	A. H. T. Davis .. ..	9th ..	—
„	J. S. McCombe .. ..	9th ..	—
„	W. J. Tobin .. ..	9th ..	—
„	R. O'Kelly .. ..	9th ..	—
„	H. V. B. Byatt .. ..	6th ..	—

**PROMOTIONS.**—9684 Quartermaster-Serjeant A. G. Tcd, September 1, 1909, to be Serjeant-Major, *vice* W. H. Taylor, to pension. 19635 Serjeant J. O'Connor, July 8, 1909, to be Staff-Serjeant, *vice* J. Stroud, appointed Instructor to London University Contingent Officers' Training Corps.

**Discharges.**—6783 Serjeant-Major W. H. Taylor, August 31, 1909, after three months' notice; 6117 Serjeant-Major B. S. Gledhill, September 15, 1909, after three months' notice; 5759 Quartermaster-Serjeant F. H. Dolman, August 31, 1909, after three months' notice; 6531 Quartermaster-Serjeant J. R. Kenshole, September 6, 1909, after three months' notice; 8131 Quartermaster-Serjeant R. Moffatt, September 7, 1909, termination of second period; 7857 Staff-Serjeant R. L. Masters, August 22, 1909, after three months' notice; 8105 Serjeant W. J. Hopkins, August 15, 1909, termination of second period; 11181 Serjeant G. Taylor, August 21, 1909, free after twelve years; 8136 Serjeant G. Piercey, September 12, 1909, termination of second period; 14601 Corporal G. Tuohy, August 29, 1909, termination of engagement; 8127 Corporal J. Taylor, September 3, 1909, termination of second period; 8608 Corporal R. Houseago, September 15, 1909, to pension; 19964 Private A. E. Marsh, August 14, 1909, termination of engagement; 7491 Private T. G. Hayhoe, August 20, 1909, after three months' notice; 208 Private B. J. Henry, July 31, 1909, on payment of £18; 8943 Private E. Davis, September 11, 1909, to pension; 17784 Private J. F. Stevens, September 6, 1909, medically unfit; 80 Private A. C. Robinson, September 12, 1909, medically unfit; 11552 Private F. Stevens, September 13, 1909, termination of first period.

**Transfers to Army Reserve.**—561 Private R. Blacker, August 10, 1909; 581 Private H. O. Edmund, August 12, 1909; 16050 Private N. McFarlane, August 7, 1909; 583 Private C. H. Kettle, August 14, 1909; 16025 Private A. Shepherd, August 7, 1909; 16080 Private A. W. Sanders, August 12, 1909; 1455 Private G. Arnott, August 19, 1909; 598 Private W. H. Cullingford, August 19, 1909; 616 Private F. M. Wilson, August 20, 1909; 16105 Private A. Bolland, August 21, 1909; 610 Private A. E. Waller, August 21, 1909; 617 Private H. C. Crouch, August 21, 1909; 16095 Private W. Groom,

August 18, 1909; 618 Private S. R. Rowley, August 22, 1909; 614 Private W. Wood, August 22, 1909; 16114 Private A. Gillespie, August 22, 1909; 17706 Corporal D. Phillips, August 24, 1909; 624 Private W. J. Rogers, August 24, 1909; 16127 Private J. McKenzie, August 25, 1909; 16154 Lance-Corporal W. Sutherland, August 26, 1909; 619 Private A. T. Pugsley, August 23, 1909; 16116 Private S. Johnson, August 25, 1909; 16126 Private W. C. Cattle, August 25, 1909; 16128 Private T. Smith, August 25, 1909; 626 Private E. O. Henderson, August 27, 1909; 19148 Private R. Milthorpe, July 31, 1909; 16153 Private S. Lyon, August 30, 1909; 16179 Private A. Ramsey, September 1, 1909; 677 Private F. Smith, September 3, 1909; 684 Private F. C. Driver, September 4, 1909; 16168 Private C. W. Hession, September 1, 1909; 670 Private C. M. Bergin, September 2, 1909; 16167 Corporal W. Greenham, September 1, 1909; 668 Private F. W. Fayers, August 31, 1909; 667 Private G. H. Jarvis, August 31, 1909; 674 Private P. W. Clarke, September 2, 1909; 682 Private A. A. Morgan, September 3, 1909; 852 Private F. H. Hillier, September 2, 1909; 16169 Private A. C. Rose, September 1, 1909; 686 Private E. G. Bramwell, September 4, 1909; 702 Private A. J. Player, September 10, 1909; 16187 Private E. Brown, September 9, 1909; 687 Private R. F. Denniston, September 5, 1909; 16197 Private A. Bolton, September 8, 1909; 16212 Private H. A. Cull, September 12, 1909; 701 Private A. E. V. Wilkins, September 10, 1909; 699 Private A. S. Wilkins, September 9, 1909; 16203 Private J. I. Robertson, September 8, 1909; 16204 Private H. Woodward, September 10, 1909; 718 Private J. Butchers, September 11, 1909; 700 Private J. Vincent, September 9, 1909.

*Transferred to other Corps.*—19696 Private A. E. Shingler, August 15, 1909, to Royal Horse and Royal Field Artillery; 8791 Serjeant V. E. Jewell, September 7, 1909, to 1st Lowland Mounted Brigade Field Artillery.

*Transferred from other Corps.*—4352 Private C. Henry, September 2, 1909, from Royal Irish Fusiliers; 4353 Private G. Newman, September 2, 1909, from Yorkshire Regiment; 4354 Private A. Bowman, September 2, 1909, from Royal Irish Regiment.

#### DEATHS.

1886 Private J. Scullion, September 8, 1909.

#### THE FOLLOWING N.C.O'S AND MEN HAVE QUALIFIED FOR PROMOTION IN THE VARIOUS CORPS EXAMINATIONS.

*For Quartermaster-Serjeant.*—9929 Staff-Serjeant J. Banks.

*For Staff-Serjeant.*—11146 Serjeant E. Wing; 10849 Serjeant C. E. T. Richmond; 18678 Serjeant L. S. Ellis; 14609 Serjeant W. P. Oldridge.

*For Serjeant.*—10581 Serjeant H. Warsop; 12589 Corporal A. Harris; 16524 Lance-Serjeant H. Fandam; 17748 Lance-Serjeant C. H. Dissent; 18110 Corporal R. W. Gibson; 18170 Corporal L. Sufrin; 18192 Corporal M. Harlen; 18239 Corporal R. F. Roland; 15848 Corporal A. E. Garbett-Burbidge; 11402 Corporal E. Stokes; 16190 Corporal J. R. Cowling; 13661 Lance-Serjeant P. J. Le Page.

*For Corporal.*—17557 Private J. F. Storie; 19085 Private C. J. Vinton; 19110 Private C. H. Smith; 994 Private G. A. Davies; 1856 Private A. F. Leaney; 29 Private J. Hart; 17388 Private J. C. Church; 19079 Private E. G. Stoneham; 19198 Private F. T. Harper; 97 Private A. A. Shave; 1843 Private C. A. Mack.

#### SPECIAL RESERVE OF OFFICERS.

*3rd Battalion, the Bedfordshire Regiment.*—Surgeon-Lieutenant Colonel Rowland H. Coombes, M.D., relinquishes his Commission, and is granted permission to retain his rank and wear the prescribed uniform, dated August 15, 1909.

#### MILITIA.

Channel Islands—The Royal Militia of the Island of Jersey.

Medical Corps, Surgeon-Lieutenant Charles A. Bois, to be Surgeon-Captain, dated August 10, 1909.

#### TERRITORIAL FORCE.

##### ROYAL FIELD ARTILLERY.

*1st Lowland Brigade.*—Surgeon-Captain (Honorary Lieutenant in the Army) William Macrae Taylor, M.D., from the 1st Midlothian Royal Garrison Artillery (Volunteers) to be Surgeon-Captain, with precedence as in the Volunteer Force, dated April 1, 1908.

*4th West Lancashire (Howitzer) Brigade.*—Surgeon-Lieutenant-Colonel and Honorary

Surgeon-Colonel Thomas F. Young, M.D., resigns his commission, and is granted permission to retain his rank and to wear the prescribed uniform, dated July 16, 1909.

#### ROYAL GARRISON ARTILLERY.

*Essex and Suffolk.*—Surgeon-Captain Charles Forsyth, M.B., to be Surgeon-Major, dated July 7, 1909.

#### ROYAL ENGINEERS (ARMY TROOPS).

*Northern Command Telegraph Companies.*—Surgeon-Captain Joseph Holmes, from the 2nd (Leeds) Yorkshire (West Riding) Royal Engineers (Volunteers), to be Surgeon-Captain, with precedence as in the Volunteer Force, dated April 1, 1908.

*Lancashire (Fortress).*—The undermentioned officers, from the Mersey Division (Electrical Engineers) Royal Engineers (Volunteers), are appointed to the unit, with rank and precedence as in the Volunteer Force, dated April 1, 1908 :—

Surgeon-Captain John Wesley Lloyd.

Surgeon-Lieutenant John Owen.

#### INFANTRY.

*4th Battalion, the Devonshire Regiment.*—Surgeon-Captain John S. S. Perkins resigns his commission, dated June 30, 1909.

*6th Battalion, the Sherwood Foresters (Nottinghamshire and Derbyshire Regiment).*—Surgeon-Lieutenant-Colonel Alfred Chawner resigns his commission, and is granted permission to retain his rank and to wear the prescribed uniform, dated July 16, 1909.

*6th Battalion, the Manchester Regiment.*—Surgeon-Major George H. Darwin, M.D., resigns his commission, and is granted permission to retain his rank and to wear the prescribed uniform, dated July 12, 1909.

*8th Battalion, the Duke of Cambridge's Own (Middlesex Regiment).*—Surgeon-Lieutenant Thomas C. Cummins resigns his commission, dated July 20, 1909.

#### ARMY MEDICAL SERVICE.

Lieutenant-Colonel Richard Harman Luce, M.B., F.R.C.S., from the 1st North Midland Field Ambulance, Royal Army Medical Corps, to be Colonel, on appointment as Administrative Medical Officer of a Territorial Division, dated April 19, 1909.

#### ROYAL ARMY MEDICAL CORPS.

*2nd London (City of London) Field Ambulance.*—The Transfer to the Territorial Force from the 4th Volunteer Battalion, the Royal Fusiliers (City of London Regiment), of Supernumerary Surgeon-Captain Henry M. Macnaughton-Jones, M.D., which was announced in the *London Gazette* of August 11, 1908, is cancelled.

*For attachment to Units other than Medical Units.*

Arthur Henry William Hunt to be Captain, dated May 7, 1900.

#### ROYAL ARMY MEDICAL CORPS.

*Eastern Mounted Brigade Field Ambulance.*—William Archibald, M.D., to be Lieutenant, dated March 1, 1909.

*3rd Southern General Hospital.*—Lieutenant-Colonel George Speirs Alexander Ranking, M.D. (late Indian Medical Service), to be Lieutenant-Colonel, dated March 15, 1909.

Edward Cecil Martin Foster to be Major, dated March 15, 1909.

*Attached to Units other than Medical Units.*

Captain Peter Paget to be Major, dated December 28, 1907.

Lieutenant William D. Watson to be Captain, dated August 8, 1908.

Captain John Howard-Jones to be Major, dated November 17, 1908.

Lieutenant John R. Armstrong to be Captain, dated June 2, 1909.

*For attachment to Units other than Medical Units.*

Albert Edward Vidler (late Captain, 1st Cinque Ports Volunteer Rifle Corps) to be Captain, dated July 14, 1909.

#### ROYAL ARMY MEDICAL CORPS.

Colonel (Honorary Captain in the Army) Charles A. MacMunn, M.D., Administrative Medical Officer, North Midland Territorial Division, resigns his commission, and is granted permission to retain his rank and to wear the prescribed uniform, dated April 19, 1909.

*2nd West Lancashire Field Ambulance.*—Lieutenant Cecil L. Williamson resigns his commission, dated July 1, 1909.

*3rd London (City of London) Field Ambulance.*—Captain William S. Sharp to be Major, dated January 11, 1909.

*2nd Northumberland Field Ambulance.*—Lieutenant George R. Ellis, M.B., to be supernumerary to the establishment, dated May 1, 1909.

*For attachments to Units other than Medical Units.*

Lieutenant John Aldington Gibb, from the 1st Home Counties Field Ambulance, Royal Army Medical Corps, to be Lieutenant, dated March 29, 1909.

Joseph Douglas Wells, M.B., to be Lieutenant, dated August 11, 1909.

The undermentioned officers to be supernumerary to the establishment :—

Captain Edward R. Williams, dated April 1, 1908.

Captain Hugh N. A. Taylor, M.D., dated April 1, 1908.

Lieutenant David A. Hughes, dated April 1, 1908.

Lieutenant Alexander Dick, dated December 2, 1908.

Captain Louis P. Demetriadi, M.D., to be Major, dated June 19, 1909.

**ROYAL ARMY MEDICAL CORPS.**

*Welsh Border Mounted Brigade Field Ambulance.*—Lieutenant Douglas Catterall Leyland Orton, from the List of Officers attached to Units other than Medical Units, to be Lieutenant, dated July 9, 1909.

*1st South Midland Field Ambulance.*—Captain Cyril H. Howkins to be Major, dated June 4, 1909.

*For attachment to Units other than Medical Units.*

Surgeon-Lieutenant Ashley Bird, from the 2nd Glamorganshire Royal Garrison Artillery (Volunteers), to be Lieutenant, with precedence as in the Volunteer Force, dated April 1, 1908.

**ROYAL ARMY MEDICAL CORPS.**

*3rd Home Counties Field Ambulance.*—Captain George A. Edsell to be Major, dated August 20, 1909.

*2nd South Midland Field Ambulance.*—Hans Frederick William Boeddicker, M.B., to be Lieutenant, dated July 1, 1909.

*3rd Wessex Field Ambulance.*—Lieutenant Alexander Milne-Thomson to be Captain, dated August 4, 1909.

Major and Honorary Surgeon-Lieutenant-Colonel Henry D. Brook, M.D., to be Lieutenant-Colonel, dated August 18, 1909.

*Attached to Units other than Medical Units.*

Francis Raymond Mitchell Heggs to be Lieutenant, dated March 1, 1909.

*Attached to Units other than Medical Units.*

Lieutenant John Alexander Preston, from the 3rd Home Counties Field Ambulance, Royal Army Medical Corps, to be Lieutenant, dated June 22, 1909.

**VOLUNTEER CORPS.****INFANTRY.**

*4th Volunteer Battalion, the Royal Fusiliers (City of London Regiment).*—Super-numerary Surgeon-Captain Henry M. MacNaughton-Jones, M.D., not having signified his wish to serve in the Territorial Force, is struck off the strength of the Battalion, dated March 31, 1908.

**NOTES FROM ALDERSHOT.**—3rd London General Hospital (T.F.). Extract from Sheldrake's *Aldershot Military Gazette*, August 20, 1909 :—

“Despite the fact that the temperature was about as uncomfortably hot as it well could be, the cosy non-commissioned officers' mess of the Royal Dublin Fusiliers was packed from the hour of eight until after midnight on Thursday, the occasion being the giving of a smoking concert to the Royal Dublin Fusiliers' Mess by the non-commissioned officers of the 3rd London General Hospital of the Territorial Army, who during their course of training at the Connaught Hospital had been made the most welcome guests and hon. members of the Mess. The chair was taken by Serjeant-Major Lowe, and he was supported in the vice-chair by Serjeant-Major Crawford, the former being supported by Major Pauli, 3rd London General Hospital, Lieutenant Ware, Lieutenant and Quartermaster Hall, R.A.M.C., Serjeant-Major Collard, R.A.M.C., Serjeant-Major Guilfoyle, Royal Dublin Fusiliers, &c., whilst invitations had also been extended and had been accepted by the representatives of other regiments and departments quartered in the Marlborough Lines. The arrangements for the entertainment were most ably carried out by a committee composed of Serjeant-Major Lowe, Serjeant-Major Crawford, and by Serjeant Pack, and the proceedings were not only conspicuous for the excellent musical numbers rendered during the evening, but also for the many expressions of professional opinion which were forthcoming of the value of the work performed by the Territorials themselves during their stay in Aldershot; but before these expressions were given utterance to, and at a

suitable moment in the programme, the Chairman submitted the toast of the Royal Dublin Fusiliers' Mess. In submitting the toast the Chairman said he was confident that he was only expressing the feelings of all members of the 3rd London General Hospital on leaving when he said that they had all spent a very happy and pleasant time in the Dublins' Mess. They had, in fact, been welcomed in the most loyal and brotherly fashion, and he did not think it too much to say that some of them at all events had had the time of their lives. This was not only the expression of opinion of the N.C.O.'s, but also of all the men who had been up for training. They desired to return to the Dublin Fusiliers' Mess their most hearty thanks, and to say that amongst them they had found some of the very best of good fellows. He need scarcely say that for some of them this had been a very great change from the daily routine of their lives. They came to Aldershot to try and learn their duty, but they could not always expect to receive such brotherly treatment at the hands of everybody. The Dublin Fusiliers had done much to make their visit a pleasurable one, and on behalf of his brother N.C.O.'s and the men he thanked them for it. They wished the Dublin Fusiliers every future prosperity and happiness, and for themselves they could only hope that they might come to Aldershot another year and be allowed to meet with them again in the same happy manner, because he was convinced that they could not meet a better lot of fellows.

"The whole of the Territorials present rose and most heartily sang 'For they are jolly good fellows,' and drank to the health of the 'Dubs' in a bumper.

"Serjeant-Major Guilfoyle, on behalf of the members of the Mess, acknowledged the toast, and in turn called upon the members to drink to the future prosperity of the 3rd London General Hospital; and it is quite needless to say that this toast was also received with an outburst of enthusiasm.

"The toast which followed was one of considerable moment, because it led up to the expression of opinion as to the value of the work which had been performed by the Territorials. The toast itself was that of the Royal Army Medical Corps, and in submitting it, the Chairman said that their very best thanks were due to the Royal Army Medical Staff of the Connaught Hospital, for not only had they made their visit a most enjoyable one, but nothing had been too great a trouble in their endeavour to make that visit one that was beneficial to themselves and to the Territorial service in general. They were taking away with them much valued information, and they desired to express their own deep sense of gratitude and appreciation of all that had been done on their behalf.

"The toast having been duly honoured, Serjeant-Major Collard, R.A.M.C., Connaught Hospital, responded, and assured the Chairman and the members of the 3rd London General Hospital that he had the greatest pleasure in doing so. He had, however, hoped that his own superior officer, Mr. Hall, would have done so. The duty had fallen upon his own shoulders, and he would not say that he did not willingly discharge it. They had welcomed the members of the 3rd London General Hospital this year amongst them in the more tangible form of part of a Territorial Army. They saw before them men who had left the warehouse, the office, or the store—men who had given up their well-earned holidays to come down and see for themselves something of the general workings of a military hospital, and to learn how to better discharge some of the duties of such an institution; and he did not know that there was any more important work in the whole of the Army than that of nursing its sick. Of the members of the 3rd London General Hospital he must at once say that they were the keenest stamp of men that he had ever met; as he had said, they were giving up their moments of leisure to acquire useful knowledge for use in their profession, and as he had gone about the hospital during their stay there he had seen them taking most copious notes of all they had been taught. When the Inspecting General himself had come round he had been very pleased with what he had seen of them and the work of the men. These good results he attributed to the indefatigable efforts of the N.C.O.'s. Socially, they had proved themselves jolly good men; not only had they Londoners amongst them, but there were Yorkshiremen and men from the South, all of the right stamp. When they knew of the coming of the Hospital to Aldershot, his own Corps was in somewhat of a predicament. They had really no place in which they could put them up, and they had had to ask themselves what they could do? They had turned to their good friends, the Royal Dublin Fusiliers, and had asked them if they could mess their friends with them, and their reply at once had been 'Certainly.' It was not the first occasion that they of the Connaught Hospital had been enabled to make a similar use of that mess-room, and now he desired to take that opportunity of most heartily thanking its present holders for their kindness and



their hospitality, for none had shown it better than the Royal Dublin Fusiliers. Their wish was that their friends of the London Hospital might come amongst them again, and that they might become even more proficient, and he believed that they would. He should like to couple with the toast, which he himself would give, 'The 3rd London General Hospital,' the names of Major Pauli and Mr. Ware. It was the first time that they had really met together as one general body, but of this he was quite convinced—that when the time came, their friends would be able to give a very good account of themselves. He asked the members of No. 2 Company, Royal Army Medical Corps, to be upstanding and drink to the toast.

"With right lusty applause, and the singing of 'They are jolly good fellows,' was the toast honoured, and

"The Chairman was noticeably touched, on responding, by the warmth of the toast's reception. They were glad to have such an expression as that from Serjeant-Major Collard of what they had done, and to know, too, that their own efforts had been appreciated.

"Lieutenant Hall, R.A.M.C., Aldershot, speaking to the toast, was assured that he could add nothing to what Serjeant-Major Collard had already so ably expressed. He was, however, fully able to thoroughly endorse all that he had said, particularly so with regard to the attention and intelligence which had been displayed by the N.C.O.'s of the 3rd London General Hospital in the work that had been put before them. To his way of thinking it was little short of remarkable the amount of information which they had digested, and he felt convinced that should they be called upon to take over the regular duties of the Royal Army Medical Corps, that they would shape up remarkably well. As he had said, he had been particularly struck with their ability to absorb information and lessons set before them, and it set him thinking, for they learned in a week things that he must confess would require a month to be learned by the regular soldier. In three days the Territorial would come and say 'I've learnt this, teach me something else or I must look elsewhere,' and it was not a bit of use trying to set them aside. If all the other sections of the Territorial Army were to take up their various duties with the same amount of enthusiasm, then he was quite convinced that the Territorial Army would become a very practical and useful body indeed. It was, as Serjeant-Major Collard had inferred, no small thing for men to come straight from the warehouse, the office, or the store, to a large military hospital, with no practical previous knowledge, and to willingly take their share in the discharge of its duties. Of course he recognised that here they had men of education and intelligence to deal with, and that, of course, was half the battle. They came to them 'as keen as mustard'; they came to learn, they meant to learn, and they took particular care that they were not told that there was not time to teach them. He thought that this particular branch of the Territorial service was bound to prove itself a success. Personally, he had taken the keenest delight in teaching them all that he knew, because he felt it to be the bounden duty of the regular soldier to teach the Territorial everything which he himself was proficient in. He knew that such efforts were very much appreciated, and he also knew that it went a very long way towards making them thorough soldiers and true friends. The speaker also joined with Serjeant-Major Collard in thanking the members of the Royal Dublin Fusiliers' Mess for the extreme kindness which they had shown towards the Medical Territorials. There was no place in camp where they could have been made more welcome in, and to him this was particularly agreeable, whilst at the same time he recognised that the members of the 3rd London General Hospital had been particularly fortunate in having been attached to such a Mess.

"Major Pauli, 3rd London General Hospital, had no idea that he should be called upon to make a speech, but he could not refrain from thanking the previous speakers for all the kind words which they had spoken. He had had many years' experience of camp life as a volunteer soldier; he felt that he was getting old in the service, because it was considerably over twenty years since he had first joined the Volunteers, but he had never had such a pleasant experience as he had enjoyed during this period of training with the 3rd General Hospital. Everybody, from the Colonel Commanding at the Connaught Hospital down to the private of the Royal Army Medical Corps, had been most anxious to teach them all they could, and on behalf of his Colonel he most respectfully returned their thanks. When they had arrived they had felt that they would be only a worry to the staff of the Hospital, but that was not their experience, and the very first thing which they had experienced on arrival was the splendid hospitality of the Royal Dublin Fusiliers Serjeants' Mess, which had accorded them a most royal welcome. He should like to personally thank Mr. Hall, the officers,

Serjeant-Major Collard, the N.C.O.'s, and everyone connected with the Royal Army Medical Corps, for all they had done for them; in fact, he was only expressing the feelings of all of the General Hospital when he said he could not sufficiently thank them. They did not want to be ornamental soldiers; they came from the City to learn their duty, and he knew full well that they were returning benefited by the knowledge that they had so kindly enabled them to acquire. They had themselves tried to do their best, and they also knew that the regular staff of the Connaught Hospital had tried to do their very best for them. They were proud to be members of the 3rd London General Hospital, but they also felt proud to have been so honoured by their hospitality. He could only say in conclusion, "Good luck to the Royal Dublin Fusiliers, and good luck to the Royal Army Medical Corps."

"Lieutenant Ware also expressed the sense of indebtedness of the London Hospital. He only wished that they had six months to stay, but they would look forward with pleasure to that time when they should come amongst them again. A fortnight was all too short in which to learn many of the great lessons which they were taught, and they could not expect or hope to learn all that which they ought to learn. All that he could say was that if at any time in the future they were set on active service, then might it be their privilege and their pleasure to serve by the side of some of those they had met and served with at this training."

"Lieutenant and Quartermaster Burke, Royal Dublin Fusiliers, was delighted to hear how thoroughly the Territorials had appreciated the hospitality of the Serjeants' Mess, and he also complimented the 3rd London General Hospital upon the efficiency of the work that they had performed, adding that it was a pleasure to him to know that the Serjeants' Mess of his own Battalion had made them so welcome during the discharge of their duties. It was always a pleasure to him to receive an invitation to any function at the old Serjeants' Mess, for he knew that he was always welcome, and the same respect was invariably shown towards him as to any other officer of the Battalion."

"The above speeches were of course interspersed with happy songs, all of which were greatly appreciated. Amongst those who contributed were Serjeant-Major Collard, 'Killarney'; Serjeant-Major Crawford, 'The Diver'; Serjeant-Major Flower, Serjeant-Major Lowe, 'Let me like a Soldier Fall'; Serjeant Macdonald, Serjeant Palmer, Serjeant Cassidy, Serjeant Phipps, recital, 'The Dandy Fifth'; Serjeant McPherson, Bandmaster Scraggs, Royal Dublin Fusiliers; Serjeant Ellis, Serjeants Pack and Flower, duet, 'Larboard Watch'; Serjeant Smith, Colour-Serjeant Hunt, Serjeant Bolton, Serjeant O'Connor, &c., and in many instances singers were called upon to give encore songs."

"The happy programme terminated with the singing of 'Auld Lang Syne' and 'God Save the King.'"

"At an impromptu smoker on Friday evening, Serjeant-Major Guilfoyle, on behalf of the members of the Royal Dublin Fusiliers, presented the 3rd London General Hospital with a fine group of the members, framed and suitably inscribed, and again the best of greetings were exchanged."

"On Saturday morning the Dublins bestowed a great honour upon the Royal Army Medical Corps Territorials, by playing them to the railway station on departure, an honour which was greatly appreciated."

## ROYAL ARMY MEDICAL COLLEGE.

Captain A. O. B. Wroughton, who was unable through illness to complete his examination at the termination of the Senior Course at the Royal Army Medical College, has now passed, and has qualified as a Specialist in Dermatology, &c.

## EXAMINATIONS.

THE following questions are published for general information.

### QUARTERMASTER-SERJEANTS.

Para. 285, b. 1.

- (1) How should the method of instruction to recruits be carried out?
- (2) In how many ways can changes of formation of a Company be usually carried out, and what are they?
- (3) Draw a rough plan to illustrate a field ambulance drawn up in line by the right.
- (4) Describe the procedure to be adopted by a Company Commander in the inspection and telling off of his company.

(5) Define the following terms : (1) Directing flank, (2) interval, (3) echelon, (4) point of formation.

(6) Describe how you would march a squad (a) through a defile, (b) past obstacles such as (1) a stream, (2) a tree.

(7) Describe generally the vehicles allotted to "B" Section of a field ambulance.

(8) Describe how a company moving in fours may form a Company Column in fours on the right.

Para. 285, b. 2.

(1) What are the qualifications required if a N.C.O. or man applies for admission into the Q.A.I.M.N.S.?

(2) Name the chief duties which the senior W.O. or N.C.O. of a military hospital would perform if there were no Sisters doing duty in the wards, but which would be undertaken by those ladies if they were so doing duty.

(3) In hospitals where a matron and nursing staff are employed, who is responsible for discipline, distribution of diets, diet summaries and equipment?

(4) What particulars are entered in the admission and discharge book? How is change of disease whilst in hospital dealt with? How are cases of transfer from other hospitals treated?

(5) A large number of patients are admitted to hospital, additional orderlies, Royal Army Medical Corps, are asked for, but are not available. How may help be obtained locally, and is payment for this help authorised?

(6) State the duties of a Dispenser as to copying and repeating prescriptions.

(7) In a mental ward, who has authority to seclude or restrain by force a violent patient? How should this be carried out?

(8) To what points should a N.C.O. cook in charge of a hospital kitchen pay attention as regards the general management and cleanliness of his kitchen?

Para. 285, b. 3.

(1) What are the regulations for the disposal of part-worn and worn-out clothing? and name the periods of wear for the following: Great coat, cape, helmet H.P., leggings.

(2) Describe the procedure by units on receipt of consignments of clothing and necessities from Royal Army Clothing Factory as regards inspection, carriers' notes, &c.

(3) When articles of equipment which have been in wear their full period have been lost, what values should be recovered and how are the values recovered?

(4) A man has lost his great coat whilst on pass. State the procedure to be carried out after investigation by Officer Commanding who has decided that the cost of replacement is to be paid for by the man. Date of issue October, 1905. Date of loss, June, 1908.

(5) State briefly how soldiers will henceforth be dealt with for clothing under the new system, e.g., A.N.C.O., whose next enlistment day is May 20, 1909.

(6) Give the scale of medical and surgical equipment from a cavalry field ambulance and a field ambulance.

(7) What are the duties of a Board of Survey on receipt of a supply of clothing? When are Stocktaking Boards held? What is the procedure and in what Army book are these proceedings of Boards recorded?

(8) What documents in connection with clothing are prepared on the transfer of a soldier, Royal Army Medical Corps, to another company?

Para. 286, b. 4.

(1) What is the procedure when unserviceable stores are destroyed?

(2) Owing to a case of urgency a special medicine is required. State how obtained and how accounted for.

(3) How are medical and surgical stores replenished in a Field Ambulance?

(4) State the precautions you would take if in charge of a medical store as regards the care and preservation of drugs and instruments (especially those of a volatile nature, and rubber goods).

(5) On the receipt of articles, field medical equipment returned from a camp, what is the procedure to be followed?

(6) What is the procedure at a District Laboratory as regards equipment? What returns are in use?

(7) What are the instructions regarding invoices when any composite article of surgical equipment is returned to store?

(8) How is the medicine return of a transport dealt with and closed at the end of the voyage?

STAFF-SERJEANTS.

Para. 284, b. 1.

(1) What documentary proceeding is required for discharge of a recruit under three months' service considered medically unfit?

(2) A soldier of eight years' service on reduction to the ranks wishes to be transferred to the Reserve. Can this be permitted? If so, how should the cause of transfer be worded. Who authorises the transfer?

(3) What is the procedure in cases where a more favourable character than "fair" cannot be given to a N.C.O.?

(4) Give special instructions to enable a younger brother to serve with an elder. Where must they be and what can General Officer Commanding do?

(5) A Corporal in an Infantry Regiment wishes to be transferred to the Royal Army Medical Corps. What qualifications must he have and what steps must his Commanding Officer take to effect the transfer?

Para. 284, b. 2.

(1) What advance of pay may be given to N.C.O.'s and men proceeding from United Kingdom to the following stations: Bermuda, Ceylon, Malta, South Africa?

(2) How is the accumulation of a large amount of obsolete documents guarded against?

(3) What is the highest possible amount of pay that can be obtained by (a) Serjeant Royal Army Medical Corps, (b) Lance-Corporal Royal Army Medical Corps.

(4) Under what conditions may a soldier of between five and twelve years' service who has been reduced to the ranks be transferred to the Reserve?

(5) Give rules for calculating the number of days on which pay is forfeited for absence without leave or on desertion.

SERJEANTS.

Para. 283, b. 1.

(1) Give the detail for the formation of fours in all positions known to you.

(2) Give the detail for forming column of half companies from company in line on the march.

(3) A company is in column facing north. Get them into line facing east and give the detail for this movement.

(4) What takes place when the command "About turn" is given to a squad on the march.

Para. 283, b. 2.

(1) Give the detail for unloading ambulance wagon.

(2) How would you make a stretcher with coats and rifles. What precautions are necessary?

(3) Give a few general rules *re* carriage of patients on stretchers.

(4) Give the detail for the order: "No. 3 Bearers, right (or left) turn, supply stretchers, quick march."

Para. 283, b. 3.

(1) What are the fines for drunkenness?

(2) The civil authorities have notified your Commanding Officer that a man has been apprehended on suspicion of having deserted from the Corps. What procedure is adopted?

(3) What are the powers of Commanding Officer.

(4) If a charge is pending against a soldier: Is he allowed to leave barracks? Is he required to attend parades? Should he be detailed for duty?

Para. 283, b. 4.

(1) What are the special points you would lay stress upon to keep barrack-rooms and buildings in a sanitary condition.

(2) How will urine tubs be dealt with?

(3) What are the duties of Orderly Serjeant of a company.

(4) Enumerate the method of laying out a kit for inspection in barrack-room.

Para. 283, b. 5.

(1) In a field kitchen what steps would you take to preserve it from flies.

(2) What precautions must be taken to preserve the purity of the water in the case of (a) a river; (b) a well in a standing camp?

(3) In the event of a case of emergency occurring in a ward what action will the Wardmaster take?

(4) What are a Wardmaster's duties with regard to the patient's diet sheets and accounts?

Para. 283, b. 6.

(1) How is a hospital diet account kept up by a Steward? What is done with it at the end of the month.

(2) What are the daily rates of hospital stoppages. How are hospital stoppage returns prepared, and to whom remitted?

(3) Pack stores: (a) How are valuables, money, and medals disposed of? (b) How are kits to be arranged and aired? (c) What happens to the clothing on discharge of a patient, or when a patient dies?

(4) What are the general rules laid down for the guidance of a Clerk to an Officer in charge of a Military Hospital in respect to duties, records, returns, discharges, register of letters, postage book, and stationery?

#### CORPORALS.

Para. 280, e. 1.

(1) How will a Lance-Corporal under four years' service confine a soldier and place him in military custody?

(2) What guides an officer in administering reproof to a non-commissioned officer?

(3) Is a soldier bound to obey an order given by a superior officer belonging to another corps?

Para. 280, e. 2.

(1) When may soldiers in confinement be allowed bedding?

(2) What is the order with regard to inspection of the cook-house, wash-house, and ablution rooms?

(3) How will meals for the guard, soldiers in arrest, and sick be issued?

Para. 280, e. 3.

Enumerate persons and objects entitled to the Military salute?

(1) How does a soldier salute: (a) when riding a bicycle; (b) if without hat or coat; (c) if one of a party of men not on parade?

(2) How are N.C.O.'s on detached duty to act in the performance of their duties?

(3) Describe how the tanks and filters of the filter cart should be cleaned and sterilised?

Para. 280, e. 4.

(1) What are the duties of a Wardmaster as regards charges against patients for damages or deficiencies?

(2) What are the duties of a nursing orderly in a sisters' ward.

(3) What are the regulations regarding the care of cooking vessels in a Hospital kitchen when the work of the day is over?

Para. 280, e. 5.

(1) What precautions are to be taken in carrying off the field patients suffering from wounds of the head?

(2) How would you lift or move an extremely weak patient when his bed is to be re-made?

(3) How would you prepare a hot, warm, or tepid bath? What precautions are to be taken when a patient is being bathed?

Para. 280, e. 6.

(1) What are the common corrosive poisons? Give the symptoms of corrosive poisoning, and the first aid treatment.

(2) Describe the treatment for a patient suffering from suffocation by coal gas.

(3) How would you treat a case of extensive superficial burns involving the trunk accompanied with symptoms of shock?

Para. 280, e. 7.

(1) Mention the methods of ventilating a room.

(2) What are the different sources of the various impurities which load the air in a badly ventilated apartment?

(3) Why is it beneficial to health to sleep with one's bedroom windows open?

Para. 280, e. 8.

- (1) What surgical appliances are contained in a surgical haversack?
- (2) What are the names of the instruments used for: (a) looking at a patients' throat; (b) to examine the eye; (c) to remove urine from the bladder; (d) to give an injection under the skin. What are ligatures, sutures and the commonest materials used for these?
- (3) What is the composition of a first field dressing? Describe the method of applying it to a bullet wound having an entrance and exit wound.

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## UNITED SERVICES MEDICAL SOCIETY.

THE next meeting of the Society will be held at the Royal Army Medical College, Millbank, S.W., on Wednesday, October 13, at 8.30 p.m., when a paper will be read by Lieutenant-Colonel P. J. Freyer, Retired Indian Medical Service, on "Total Enucleation of the Prostate: Practical Observations on the Operation."

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## MARRIAGE.

PARKES-STROTHER.—June 2, 1909, at St. Saviour's Church, St. George's Square, London, S.W., by the Rev. W. E. C. Barns, M.A., Edward Ernest Parkes, M.B., Captain Royal Army Medical Corps, third son of John Parkes, Esq., Shrewsbury Road, Dublin, to Elsie Mary, only child of Dr. and Mrs. W. H. Hugall Strother, Sheerness-on-Sea.

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## DEATHS.

DOIG.—On August 11, 1909, at Woking, Honorary Brigade-Surgeon Alexander Doig, A.M.S., retired, aged 67. He entered the Service April 14, 1863; became Surgeon Army Medical Department, March 1, 1873; Surgeon-Major Army Medical Department, April 28, 1876; Surgeon-Lieutenant-Colonel April 14, 1883; retiring with the Honorary rank of Brigade-Surgeon, April 14, 1883. His War Service was as follows: Ashanti War, 1873-4. Medal.

FAIRLAND.—On August 6, 1909, at Silvertown, near Christchurch, Brigade-Surgeon-Lieutenant-Colonel Edwin James Fairland, A.M.S., retired, aged 64. He entered the Service April 1, 1867; became Surgeon Army Medical Department, March 1, 1873; Surgeon-Major Army Medical Department, April 1, 1879; Surgeon-Lieutenant-Colonel Medical Staff, April 1, 1887; Brigade Surgeon-Lieutenant-Colonel Army Medical Staff, February 16, 1893; retired on retired pay April 7, 1897. His War Service was as follows: Abyssinian Expedition 1867-8. Medal.

LONG.—On September 9, 1909, Honorary Brigade-Surgeon Alexander Long, A.M.D., retired, aged 70. He entered the Service March 1, 1861; became Surgeon Army Medical Department, March 1, 1873; Surgeon-Major May 13, 1875; Surgeon-Lieutenant-Colonel March 1, 1881; retired on retired pay with Honorary rank of Brigade-Surgeon, January 16, 1884. His War Service was as follows: Afghan War, 1878-80. Medal.

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## EXCHANGES, &c.

*The charge for inserting Notices respecting Exchanges in the Royal Army Medical Corps is 5/- for not more than five lines, which should be forwarded by Cheque or P.O.O., with the notice, to Messrs. G. STREET and CO., Ltd., 8, Serle Street, London, W.C., not later than the 22nd of the month.*

Captain Dorgan, who arrived home November 23, 1906, about 2½ years' (probably more) home service, wishes to exchange so as to extend home service by at least a year. Address Barracks, Cork.

In the event of Reprints or "Excerpts" of articles being required by the authors, notification of such must be sent when submitting the papers. Reprints and Excerpts may be obtained at the following rates, and additional copies at proportionate rates :—

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## Notices.

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### EDITORIAL NOTICES.

The Editor will be glad to receive original communications upon professional subjects, travel, and personal experiences, &c. He will also be glad to receive items of news and information regarding matters of interest to the Corps from the various garrisons, districts, and commands at home and abroad.

**All such Communications or Articles accepted and published in the "Journal of the Royal Army Medical Corps" will (unless the Author notified at the time of submission that he reserves the copyright of the Article to himself) become the property of the Library and Journal Committee, who will exercise full copyright powers concerning such Articles.**

Matter intended for the Corps News should reach the Editor not later than the 15th of each month for the following month's issue. Notices of Births, Marriages, and Deaths are inserted free of charge to subscribers and members of the Corps. All these communications should be written upon one side of the paper only; they should by preference be type-written, but, if not, all proper names should be written in capital letters (or printed) to avoid mistakes, and be addressed The Editor, "JOURNAL OF THE ROYAL ARMY MEDICAL CORPS," War Office, Whitehall, London, S.W.

Communications have been received from Major H. C. French, Major R. J. Blackham, Captain J. B. Clarke, Major N. Faichnie, Captain F. Harvey, Colonel R. H. Forman, Captain D. Harvey, Captain R. H. Bridges, Major F. J. W. Porter, Major J. McCarthy, Lieutenant W. E. Marshall, Major J. B. Anderson, Lieutenant-Colonel G. S. Thompson, Captain Chas. White, Lieutenant-Colonel W. A. Morris, Colonel T. M. Corker, Major C. E. Pollock, Major S. F. St. D. Green, Captain V. G. Johnson, Colonel O. E. P. Lloyd, Major H. P. Johnson, Major D. J. Collins.

The following publications have been received:—

*British: Medical Press and Circular, The Journal of Tropical Medicine and Hygiene, Army and Navy Gazette, The Hospital, The Lancet, On the March, The Journal of Practical Dietetics and Bacterio-Therapeutics, The Royal Engineers' Journal, Journal of the Royal Sanitary Institute, The Practitioner, Public Health, The Medical Review, Red Cross and Ambulance News, Guy's Hospital Gazette, The Agricultural Journal, The Journal of Tropical Veterinary Science, St. Bartholomew's Hospital Journal, Statistical and General Report of the Army Veterinary Service, Journal of the Royal United Service Institution, The Australian Medical Gazette, The All-India Hospital Assistants' Journal.*

*Foreign: Archiv für Schiffs- und Tropen-Hygiene, Archives de Médecine et de Pharmacie Militaires, Indian Medical Gazette, Le Caducée, The Cleveland Medical Journal, Revista de Sanidad Militar y La Medicina Militar Española, Archives de Médecine Navale, The Military Surgeon, American Medicine, Annali de Medicina Navale E Coloniale, The Philippine Journal of Science, Bulletin de l'Institut Pasteur, Giornale di Medicina Militare, Memorias do Instituto Oswaldo Cruz.*



### MANAGER'S NOTICES.

The JOURNAL OF THE ROYAL ARMY MEDICAL CORPS is published monthly, six months constituting one volume, a volume commencing on 1st July and 1st January of each year.

The Annual Subscription is £1 (which includes postage), and should commence either on 1st July or 1st January; but if a subscriber wishes to commence at any other month he may do so by paying for the odd months between 1st July and 1st January at the rate of 1s. 8d. (one shilling and eightpence) per copy. (All subscriptions are payable in advance.)

Single copies can be obtained at the rate of 2s. per copy.

The Corps News is also issued separately from the Journal, and can be subscribed for at the rate of 2s. (two shillings) per annum, including postage. Subscriptions should commence from 1st July each year; but if intending subscribers wish to commence from any other month, they may do so by paying for the odd months at the rate of 2d. per copy. (All subscriptions are payable in advance.)

**Officers of the Royal Army Medical Corps possessing Diplomas in Public Health, &c., are kindly requested to register their special qualifications at Headquarters. Letters of complaint are frequently received from officers stating that their special qualifications have not been shown in the Distribution List which is published as a supplement to the Journal in January and July of each year. As, however, the particulars of this list are supplied from official sources, officers are reminded that unless the possession of Diplomas, &c., has been registered at Headquarters, no entry of such qualifications can be recorded in the Distribution List.**

Letters regarding non-delivery of the Journal, or change of address, should be sent to the Hon. Manager, "Journal of the Royal Army Medical Corps," War Office, Whitehall, London, S.W., and reach there not later than the 20th of each month.

It is requested that all Cheques or Postal Orders for Subscriptions to the Journal, Corps News, Reprints, &c., be crossed "Holt & Co.," and made payable to the "Hon. Manager, Journal R.A.M.C.," and not to any individual personally.

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# JOURNAL OF THE ROYAL ARMY MEDICAL CORPS.

## Corps News.

NOVEMBER, 1909.

### ARMY MEDICAL SERVICE.

Lieutenant-Colonel Edward Butt, from the Royal Army Medical Corps, to be Colonel, *vice* J. G. Harwood, retired, dated September 15, 1909.

### ROYAL ARMY MEDICAL CORPS.

Quartermaster and Honorary Lieutenant Thomas J. Jacomb retires on retired pay, dated September 25, 1909.

Serjeant-Major Ernest Victor Saunders to be Quartermaster, with the honorary rank of Lieutenant, *vice* Honorary Lieutenant T. J. Jacomb, dated September 25, 1909.

Quartermaster and Honorary Lieutenant Harry Spackman, R.A.M.C., is granted the honorary rank of Captain, dated October 4, 1909.

Quartermaster and Honorary Captain Philip Macintosh, R.A.M.C., is placed on retired pay, dated October 12, 1909.

**ARRIVALS HOME TOUR EXPIRED.**—From Egypt: Lieutenant-Colonel J. D. F. Donegan, Majors P. Evans and C. K. Morgan. From Gibraltar: Lieutenant-Colonel T. DuB. Whaite and Major H. A. Berryman. From Malta: Lieutenant-Colonel M. T. Yarr, Major A. E. Master, Captain H. S. Anderson, and Quartermaster and Honorary Lieutenant A. Morrison.

**TRANSFERRED TO HOME ESTABLISHMENT.**—Lieutenant-Colonels G. E. Hale, H. M. Adamson, A. Kennedy, and Major M. Boyle.

**POSTINGS.**—Northern Command: Lieutenant-Colonel H. M. Adamson. Aldershot Command: Captains F. S. Irvine and A. C. H. Gray. Eastern Command: Lieutenant-Colonel T. DuB. Whaite, Major A. E. Master, and Captain H. V. Bagshawe. Western Command: Major H. A. Berryman. Southern Command: Lieutenant-Colonels A. Kennedy and J. F. Donegan, Major P. Evans. Irish Command: Lieutenant-Colonel M. T. Yarr, Major C. K. Morgan, and Captain H. S. Anderson. London District: Lieutenant-Colonel R. H. S. Sawyer.

**APPOINTMENTS.**—Surgeon-General W. W. Kenny, Principal Medical Officer, Northern Command; Colonel O. E. P. Lloyd, V.C., Principal Medical Officer in South Africa; Lieutenant-Colonel R. H. S. Sawyer, Charge of Queen Alexandra's Military Hospital, London; Lieutenant-Colonel A. Kennedy, Charge of D Block, Royal Victoria Hospital, Netley; Lieutenant-Colonel G. E. Hale, D.S.O., Medical Inspector of Recruits, Eastern Command; Lieutenant-Colonel F. J. Jencken, Charge of Royal Victoria Hospital, Netley; Lieutenant-Colonel R. J. C. Cottell, Physician and Surgeon, Royal Hospital, Chelsea; Lieutenant-Colonel W. Keays (R.P.), Medical Charge, Weymouth; Major P. Evans, Surgical Specialist, Devonport; Major T. W. Gibbard, Lecturer in Syphilology at Royal Army Medical College, and Charge of Military Hospital, Rochester Row; Major F. W. Hardy, Sanitary Officer, Eastern Command; Major F. Kiddle, Deputy Surgeon, Royal Hospital, Chelsea; Major C. W. Duggan (R.P.), Medical Charge, Lincoln; Captain J. Dorgan (conditional on exchanging),

Sanitary Officer, Irish Command; Captain L. W. Harrison, Pathologist, Military Hospital, Rochester Row; Captain M. F. Foulds, Specialist in Operative Surgery, Belfast; Captain F. S. Irvine, Adjutant Depôt, Royal Army Medical Corps, Aldershot.

**TRANSFERS.**—Major F. W. Hardy, from Southern to Eastern Command.

**ARRIVALS HOME ON LEAVE.**—From South Africa: Captains J. A. Anderson and R. A. Bryden. From India: Captain V. G. Johnson. From Malta: Captain M. H. Babington.

**EXCHANGE ON FOREIGN SERVICE ROSTER.**—Lieutenant-Colonel T. H. F. Clarkson and Major C. T. Samman.

**INCREASED PAY.**—Lieutenant-Colonels A. Dodd and G. Wilson have been selected for increased pay.

**QUALIFICATION.**—Captain J. C. Kennedy has obtained the M.D. Edin. and Diploma of Tropical Medicine and Hygiene, Cambridge.

**RESIGNATION OF APPOINTMENTS.**—Lieutenant-Colonel J. McLaughlin (R.P.) has resigned the appointment of Recruiting Medical Officer, Belfast; Major G. M. Dobson (R.P.) has resigned the Medical Charge at Shrewsbury.

**APPOINTMENT.**—Lieutenant-Colonel C. J. W. Tatham (R.P., R.A.M.C.) has been appointed Assistant Medical Officer of Health to the Borough of Scarborough.

The following appointments for retired medical officers as Staff Officers to Administrative Medical Officers of Divisions, Territorial Force, are now vacant: Northumbrian, West Riding, Lowland, East Lancashire, and West Lancashire. The salary is £100 per annum in addition to retired pay, with travelling and field allowance when issuable. If required to attend training in camp, they will be provided with horses and forage if necessary. An allowance of £25 per annum is made to officers holding these appointments to cover the cost of providing any office accommodation or clerical assistance that may be necessary, and of postage, stationery, and other contingent expenses.

**EMBARKATIONS.**—For Hong Kong: Lieutenant-Colonel Sir J. Fayer, Bart., and Captain A. D. Waring. For Singapore: Captains B. R. Dennis and R. M. Skinner. For Egypt: Colonel J. M. Jones and Quartermaster and Honorary Lieutenant A. J. Chalk. For India: Lieutenant-Colonels J. S. Davidson and A. T. I. Lilly; Majors C. R. Elliott and J. Alexander; Captains W. R. Galwey, R. A. Cunningham, C. W. Mainprize, G. J. S. Archer, and M. M. Lowsley; Lieutenants H. P. Hart, F. T. Dowling, D. B. McGrigor, A. Hendry, J. R. Lloyd, W. G. Aviss, J. F. Grant, F. H. M. Chapman, J. A. Renshaw, R. G. S. Gregg, A. Fortescue, H. H. Blake, H. W. Carson, A. H. T. Davis, R. F. O'T. Dickinson, A. E. B. Jones, R. de V. King, C. P. O'Brien Butler, T. McO. Phillips, and W. A. Spong. For South Africa: Major J. Thomson, Captain E. W. Siberry, and Lieutenant C. McQueen. For West Coast Africa: Captains J. B. Clarke, H. W. Long, and G. R. Painton.

## RESULTS OF EXAMINATION OF LIEUTENANTS, ROYAL ARMY MEDICAL CORPS.

The following results of examinations are notified for general information:—

Passed in (h) i for rank of Captain: Lieutenant D. F. Mackenzie, M.B.

Passed in (b): R. M. Dickson, M.B.

**NOTES FROM MALTA.**—Captain Gibbon writes: "On September 25 the officers of the Royal Army Medical Corps held a dinner at Sliema to bid farewell to Lieutenant-Colonel M. T. Yarr, Major A. E. Master, Captains Anderson and Winckworth, who have since left us. Lieutenant-Colonel A. F. Russell, C.M.G., was in the chair, in the absence of our Principal Medical Officer, who had not returned from leave. Twenty-four officers sat down to dinner, amongst whom were Major French and Captain Baker, who had just joined us from home. Besides those mentioned above we have also lost Lieutenant-Colonel J. J. Gerrard and Major C. E. Pollock, both of whom were on leave, and have been struck off the strength of the Island. This trooping season five officers have already gone home, only two of whom were tour-expired, the other three getting away before their full tour on account of the evacuation of Crete, and the return of three medical officers from there to swell our numbers.

"On September 22 the sergeants of No. 30 Company gave a supper and smoking concert in their new mess over Zabbar Gate, at Cottonera Hospital, to the members who have since embarked for England, namely, Quartermaster-Serjeant Rossiter, Staff-Serjeant Cowthard, Serjeants Lampard, Spowage, and Delamare. At 8 p.m. supper

was served, after which, with Serjeant-Major Dudman in the chair, a long programme of songs and toasts was got through, ending at midnight with 'Auld Lang Syne.'

"Another concert was held at Cottonera on September 27 to speed the twenty-seven N.C.O.'s and men who left the next day on board the 'Braemar Castle.' Supper was served at 7 p.m., and at 8 p.m. punctually Serjeant-Major Stanley took the chair, and the concert began.

Toast	..	..	..	..	'The King.'
PART I.					
1. March	..	..	..	..	Selected .. .. Prof. DALLI'S BAND.
2. Song..	..	..	..	..	Selected .. .. Serjt. BOTTOMLEY.
3. Song (Comic)	..	..	..	..	'Far too Early in the Morning' Lance-Corpl. MURPHY.
4. Song	..	..	..	..	'Dear Home Land' .. .. Mr. JOHNSON.
5. Mandoline Selection	..	..	..	..	.. .. Prof. DALLI.
6. Song..	..	..	..	..	'The Holy City' .. .. Corpl. MYATT.
7. Song (Comic)	..	..	..	..	'In the Twi-twi-light' .. .. Pte. HERBERT.
8. Song	..	..	..	..	'Love Me and the World is Mine' .. .. Serjt. BLAIR.
9. Duet..	..	..	..	..	'Coster and Swell' .. Ptes. PLUME and GOGAN.
10. Toast	..	..	..	..	'Our Departing Comrades' Serjt.-Major STANLEY.
11. Song..	..	..	..	..	'Queen of the Earth' .. .. Pte. NOBLE.
12. Selection	..	..	..	..	.. .. Prof. DALLI'S BAND.

## PART II.

1. Pianoforte Solo	..	..	..	..	..	Serjt. BOTTOMLEY.
2. Song..	..	..	..	..	..	'Sing me to Sleep' .. .. Pte. WOOLWAY.
3. Song	..	..	..	..	..	'Margueritte' .. .. Mr. JOHNSON.
4. Toast	..	..	..	..	..	'Our Officers' .. .. Serjt.-Major STANLEY.
5. Song..	..	..	..	..	..	'Flight of Ages' .. .. Corpl. MYATT.
6. Recitation (Comic)	..	..	..	..	..	'The Man from Buffalo' .. .. Lance-Corpl. BURNS.
7. Song	..	..	..	..	..	'Ireland' .. .. Serjt. BLAIR.
8. Selection	..	..	..	..	..	.. .. Prof. DALLI'S BAND.
9. Hornpipe	..	..	..	..	..	.. .. Pte. GIBBONS.
10. Song (Comic)	..	..	..	..	..	'Galloping Major' .. .. Lance-Corpl. MURPHY.
11. Song	..	..	..	..	..	'Genevieve' .. .. Pte. NOBLE.
12. Selection	..	..	..	..	..	.. .. Prof. DALLI'S BAND.
13. Song	..	..	..	..	..	'In the Cradle of the Deep' .. .. Corpl. MYATT.

"Answering the toast of 'Our Officers,' Captain Carter, our Company Officer, presented the cricket ball and bat to Lance-Corporal Cowx and Private Foster for the highest bowling and batting averages, respectively, during the past season. A very pleasant evening was brought to a close at midnight by the singing of 'Auld Lang Syne.'

"The headquarters' annual outing was held on September 14 and 16 by half companies, but space prevents any description except to say that everyone appreciated the relaxation from the routine of duty and thoroughly enjoyed the day.

"The cricket season has come to a close with our match *versus* the Royal Inniskillings on September 10, and already the football goal-posts can be seen everywhere taking the place of the matting and wickets. Looking back we find that we played in all fourteen matches, winning six, losing five, and drawing three; not a bad performance considering we are only a company, and scattered, and yet we have been able to hold our own with the different regimental teams. The following are the averages of those who played oftenest, and it can be gathered how hard selection was when we find that more than twenty names appear as having played for the Corps team:—

## BATTING AVERAGES.

Rank and Name	Innings	Times not out	Most in Innings	Total Runs	Average
Capt. T. H. Gibbon..	13	2	84	375	34.1
Pte. W. Foster	13	—	47	241	18.5
Lieut. H. G. Gibson	13	3	35	161	16.1
Pte. P. Martin	10	2	39	96	12.0
Capt. J. Maughan	13	—	34	125	11.4
Serjt. G. Lampard	17	—	54	182	10.6
Lance-Corpl. R. Cowx	13	—	25	115	9.5

## BOWLING AVERAGES.

Rank and Name	Overs	Maidens	Runs	Wickets	Average
Lance-Corpl. R. Cowx	186	29	715	55	13.0
Serjt. G. Lampard	93	6	432	29	14.9
Capt. T. H. Gibbon	111	15	448	27	16.5
Pte. J. Grogan	64	2	309	11	28.0

"We got to the semi-final of the Governor's Cup and were then beaten by the Royal Engineers, who eventually won the Cup; but we did not do so well in the Soldiers' Cup, being beaten in our first encounter by the Eastern District Gunners, mainly by weak batting and trying to score before being really at home with the bowling. No retrospect is ever complete without a forecast, and for next season we have to mourn the loss of Lance-Corporal Cowx, our best bowler—not only our best bowler, but on his day one of the best in the Island. We shall also miss Serjeant Lampard, always ready and keen both as a bowler and a bat. Private Foster, too, who took the average bat, has also left us, and but for injured fingers would have probably done better. However, Lieutenant-Colonel White and Lieutenant Beaman have joined us, and we lose no officers that played this year; and if only we can find a bowler everything ought to go well with us for 1910.

"The coming football season has much in store for us. We did well last year, and ought to have improved this, but we will know more of that next month. Captain T. H. Gibbon has been elected Honorary Captain, with Lance-Corporal Turner Captain on the field, and Lance-Corporal Blundell as Vice-Captain. Lieutenant Gibson captains our hockey team, and we hear rumours of a hockey league."

**NOTES FROM SIMLA.**—Lieutenant-Colonel R. S. F. Henderson, R.A.M.C., Secretary to Principal Medical Officer, His Majesty's Forces in India, writes (dated September 16, 1909):—

"*Appointments.*—Colonel F. B. Maclean, Principal Medical Officer, Secunderabad Brigade, has been appointed to officiate as Principal Medical Officer, 8th (Lucknow) Division, with effect from September 9, 1909, *vice* Surgeon-General P. M. Ellis, on leave. Colonel L. E. Anderson has reverted to his permanent appointment as Principal Medical Officer, Allahabad and Fyzabad Brigades, with effect from September 9, 1909.

"The following officers have been detailed for service at Aden during the ensuing trooping season:—

"(1) Lieutenant-Colonel L. W. Swabey, 8th (Lucknow) Division, *vice* Lieutenant-Colonel A. Kennedy, sailing by 2nd Transport 'Dongola,' October 27, 1909, from Bombay, to command Station Hospital, Aden, until the arrival of Lieutenant-Colonel T. J. O'Donnell.

"(2) Lieutenant-Colonel T. J. O'Donnell, D.S.O., 4th (Quetta) Division, to relieve Major C. Dalton, V.H.S., and sail by 7th Transport "Dufferin," January 25, 1910, from Bombay to command Station Hospital, Aden.

"(3) Captain P. J. Dwyer, 5th (Mhow) Division, to relieve Captain D. P. Watson, and sail by 7th Transport "Dufferin," January 25, 1910, from Bombay.

"(4) Captain C. W. O'Brien, 1st (Peshawar) Division, to relieve Captain F. J. Garland, and sail by 11th Transport "Plassy," March 11, 1910, from Bombay.

"(5) Captain E. G. R. Lithgow, 2nd (Rawal Pindi) Division, *vice* Captain F. M. M. Ommanney, to sail by 11th Transport "Plassy," March 11, 1910, from Bombay.

"*Health of Troops, Improvement in.*—In a circular letter recently issued His Excellency the Commander-in-Chief draws attention to the great improvement in the health of both British and Indian troops which has taken place during recent years. His Excellency congratulates all concerned, and views the results with the greatest satisfaction as the outcome of their strenuous efforts, in which he has always taken the greatest interest.

"In the tables which accompany the letter a comparison is drawn between the sickness and mortality during the decennium 1894-1903 and that of each subsequent year. They show a progressive and very marked diminution both in the total amount of sickness and mortality from all causes and in the principal preventible diseases to which the soldier is liable.

"Among British troops the death-rate was 17·18 per 1,000 between 1894 and 1903 as compared with 9·09 in 1908, and the number of men constantly sick in hospital has been reduced from 5,374 to 3,139 in the same period. This means a saving of some 500 lives yearly, and an addition to the fighting strength of British troops of some 2,000 men.

"Enteric fever between 1894 and 1903 caused on an average 1,476 attacks and 380 deaths yearly; in 1908 there were only 998 cases and 188 deaths. Similarly, the amount of dysentery has been reduced to one-half, of malaria to two-thirds, and venereal diseases to one-fifth. There were 2,123 invalids sent to England yearly between 1894 and 1903, and 905 in 1908.

"In the Indian Army the reduction has been scarcely less marked. Comparing the yearly average for the period 1894-1903 with the number for 1908, it is seen that the death-rate has been reduced from 11·33 to 7·41, the number constantly sick in hospital

from 3,721 to 2,749. The deaths from dysentery and pneumonia are about one-half, and the admissions to hospital for malaria and venereal diseases two-thirds and one-half of what they formerly were. The figures for enteric fever in the Indian Army, though far less than those for British troops, show some progressive increase, probably owing to the disease being more generally recognised than formerly."

*Relief.*

A LIST OF TOUR-EXPIRED OFFICERS DETAILED TO EMBARK FOR HOME DURING THE COMING TROOPING SEASON IS GIVEN BELOW :—

Transport and date of sailing	Rank and name	Division or brigade	Remarks
1st Transport "Robilla," October 14, 1909, from Bombay	Lieut.-Col. J. R. Forrest	Burma ..	In medical charge.
	Major E. A. Burnside ..	5th (Mhow)	Doing duty.
	" R. C. Thacker ..	4th (Quetta)	" "
	" E. S. Clarke ..	1st (Peshawar)	" "
	Captain W. McD. Medowall	3rd (Lahore)	" "
2nd Transport "Don- gola," October 27, 1909, from Bombay. (Leaves Aden, Novem- ber 1, 1909)	" B. G. Patch ..	6th (Poona)	In "medical" charge.
	Lieut.-Col. C. T. Blackwell	Burma ..	Doing duty.
	Major J. W. Jennings, D.S.O.	5th (Mhow)	" "
	Captain S. L. Pallant ..	" "	" "
	" F. J. Turner ..	Burma ..	" "
	" R. H. MacNicol	7th (Meerut)	In medical charge.
3rd Transport "Plassy" (Hospital Ship), No- vember 5, 1909, from Bombay	Lieut.-Col. F. J. Jencken	8th (Lucknow)	Doing duty.
	" F. S. LeQuesne, V.C.	5th (Mhow)	" "
	Major W. E. Hudleston..	9th (Secunderabad)	" "
	" F. Kiddle ..	6th (Poona)	" "
	" H. E. Winter ..	9th (Secunderabad)	" "
	Captain W. F. H. Vaughan	Army Head- quarters	In medical charge.
4th Transport "Ro- hilla," December 10, 1909, from Karachi	Lieut.-Col. A. R. Aldridge	7th (Meerut)	Doing duty.
	Major H. W. K. Read ..	4th (Quetta)	" "
	Captain J. D. Richmond	" "	" "
	" H. Harding ..	" "	" "
	" R. B. Hole ..	" "	" "
	" M. F. Grant ..	" "	" "
5th Transport "Don- gola," December 31, 1909, from Karachi	Lieut.-Col. F. P. Nicholls	3rd (Lahore)	In medical charge.
	" H. A. Haines*	8th (Lucknow)	Doing duty up to Port Said.
	" D. M. O'Callaghan	2nd (Rawal Pindi)	Doing duty.
	Major B. J. Inniss ..	7th (Meerut)	" "
	Captain S. M. W. Meadows	2nd (Rawal Pindi)	" "
	" M. D. Ahern ..	3rd (Lahore)	" "
6th Transport "Plassy" (Hospital Ship), January 11, 1910, from Bombay	Lieut.-Col. G. Wilson ..	2nd "Rawal Pindi)	In medical charge.
	" H. D. Rowan	Army Head- quarters	Doing duty.
	Major K. M. Cameron ..	Burma ..	" "
	Captain H. C. Hildreth, F.R.C.S.E.	" "	" "
	" A. C. Osburn ..	9th (Secunderabad)	" "
	" W. Wiley ..	5th (Mhow)	" "
	" A. L. Otway ..		" "

\* Will proceed on six weeks' leave from date of arrival at Port Said.

**A LIST OF TOUR-EXPIRED OFFICERS DETAILED TO EMBARK FOR HOME DURING THE  
COMING TROOPING SEASON.—Continued.**

Transport and date of sailing	Rank and name	Division or brigade	Remarks
7th Transport "Dufferin," January 25, 1910, from Bombay. (Leaves Aden, February 1, 1910)	Lieut.-Col. H. Cocks ..	9th (Secunderabad)	In medical charge.
	" H. P. G. El-kington	5th (Mhow)	Doing duty.
	Major C. Dalton, V.H.S.	Aden ..	" "
	Captain S. O. Hall ..	9th (Secunderabad)	" "
	" J. Fairbairn ..	6th (Poona)	" "
8th Transport "Rewa," February 2, 1910, from Karachi	" A. S. Arthur ..	5th (Mhow)	" "
	" D. P. Watson	Aden ..	" "
	Lieut.-Col. W. T. Swan..	7th (Meerut)	In medical charge.
	Major J. B. Anderson ..	8th (Lucknow)	Doing duty.
	Captain R. T. Collins ..	7th (Meerut)	" "
9th Transport "Rhilla," February 11, 1910, from Karachi	" A. J. Huil ..	3rd (Lahore)	" "
	Lieut.-Col. F. W. Gordon	7th (Meerut)	In medical charge.
	Hall		
	Major J. Grech .. ..	"	Doing duty.
	Captain M. C. Wetherell		" "
10th Transport "Dongola," March 2, 1910, from Bombay	" J. H. Douglass..	9th (Secunderabad)	" "
	Lieut.-Col. P. C. H. Gordon	Burma ..	In medical charge.
	Major A. J. Luther ..	"	Doing duty.
	" St. J. B. Killery ..	7th (Meerut)	" "
	Captain T. E. Harty ..	Burma ..	" "
11th Transport "Plassy" (Hospital Ship), March 11, 1910, from Bombay (leaves Aden, March 16, 1910)	" D. P. Johnstone	" ..	" "
	" G. B. Carter ..	9th (Secunderabad)	" "
	" R. R. Lewis ..		
	Lieut.-Col. W. W. Pike,	8th (Lucknow)	In medical charge.
	D.S.O., F.R.C.S.I.		
	Major T. McDermott ..		Doing duty.
	Captain J. A. Turnbull ..	1st (Peshawar)	" "
	" F. J. Garland ..	Aden ..	" "
	" F. H. Noke ..	6th (Poona)	" "
	" G. E. Cathcart..	2nd (Rawal Pindi)	" "

**PROMOTIONS.**—9579 Quartermaster-Serjeant C. F. Houston, September 16, 1909, to be Serjeant-Major, *vice* B. S. Gledhill, to pension; 8704 Quartermaster-Serjeant T. J. Tilbrook, September 25, 1909, to be Serjeant-Major, *vice* E. V. Saunders, to H.M. Commission.

**Discharges.**—7725 Staff-Serjeant H. J. Willis, September 30, 1909, after three months' notice; 2969 Staff-Serjeant W. Haddon, September 30, 1909, after three months' notice; 8164 Staff-Serjeant H. J. Power, October 14, 1909, termination of second period; 8156 Serjeant A. D. Wattson, October 4, 1909, termination of second period; 17922 Corporal R. I. Mackenzie, September 8, 1909, on payment of £25; 19580 Private J. F. St. George, September 14, 1909, medically unfit; 1950 Private S. M. Weaver, September 29, 1909, medically unfit; 4387 Private G. I'Anson, September 24, 1909, on payment of £10; 11562 Private A. Rackley, October 7, 1909, termination of first period; 8167 Serjeant W. Singleton, October 15, 1909, termination of second period.

**Transfers to Army Reserve.**—720 Private S. G. Sandford, September 12, 1909; 722 Private E. E. Stedham, September 12, 1909; 16210 Private W. Allen, September 16, 1909; 735 Private W. Johns, September 16, 1909; 721 Private A. Savage, September 12, 1909; 1108 Private J. A. C. Nicholson, September 11, 1909; 717 Private O. Travis, September 11, 1909; 16215 Private S. E. Roberts, September 19, 1909; 746 Private C.

Harvey, September 20, 1909; 16232 Private W. Knox, September 22, 1909; 747 Private J. G. Reynolds, September 21, 1909; 16242 Private A. Porter, September 24, 1909; 770 Private T. Matthews, September 23, 1909; 766 Private A. E. Jenkins, September 25, 1909; 16156 Private W. T. Mitchell, August 30, 1909; 16258 Lance-Corporal P. Bartleman, September 29, 1909; 16395 Lance-Corporal A. E. Newens, September 25, 1909; 773 Private J. McInnes, September 26, 1909; 16262 Private A. Brown, September 29, 1909; 784 Private L. Wickenden, September 30, 1909; 783 Private J. Sullivan, September 30, 1909; 891 Private A. P. Luxemburg, September 6, 1909; 788 Private G. H. Sheldon, October 2, 1909; 791 Private P. McLaughlan, October 2, 1909; 16305 Private J. McVeigh, October 8, 1909; 16291 Private R. Horne, October 6, 1909; 16317 Private S. Davenport, October 8, 1909; 16292 Private J. Pegram, October 6, 1909; 16290 Private R. E. Dorey, October 6, 1909; 16306 Private T. Cameron, October 8, 1909.

*Transfers to other Corps.*—16477 Corporal S. Bolsover, September 25, 1909, to 2nd Border Regiment; 2079 Private J. Brooks, September 30, 1909, to 112th Battery, Royal Field Artillery; 9502 Staff-Serjeant A. Fletcher, October 1, 1909, School of Instruction, Cardiff.

*Transfers from other Corps.*—4382 Private J. Sidney, September 8, 1909, from Middlesex Regiment; 4390 Private T. Barlow, August 1, 1909, from Loyal North Lancashire Regiment; 4427 Private A. Richards, September 21, 1909, from 4th Rifle Brigade.

*Embarkations for Abroad.*—To Egypt, per ss. "Braemar Castle," September 10, 1909.—Serjeant-Major W. Brennan, 17260 Serjeant G. W. Payne, 11822 Lance-Corporal G. E. Johnson, 18332 Lance-Corporal B. B. Bevan, 17400 Private P. Sarsfield, 585 Private G. Webb, 750 Private W. Woodward, 1268 Private J. Gray, 1830 Private J. E. Burr, 2027 Private E. H. Coney, 2106 Private J. MacDonald, 2159 Private H. Dixon, 1562 Private B. Mogford.

To Malta, per ss. "Braemar Castle," September 10, 1909.—18678 Serjeant L. S. Ellis, 11258 Corporal G. Leggatt, 11553 Private G. W. Leach, 15902 Private G. Hammond, 16258 Private J. Whittaker, 17680 Private T. Lenihan, 201 Private H. Besznak, 1051 Private W. M. Davis, 19620 Private W. J. Carter, 1860 Private A. J. Wood.

To Tientsin, per ss. "Soudan," September 14, 1909.—10009 Quartermaster-Serjeant J. D. Genese, 12890 Serjeant J. S. Gardiner, 19436 Corporal H. Worbis, 19472 Private C. E. Manson, 19119 Private W. E. Bennett, 511 Private F. Beauchamp, 580 Private A. Adams.

To Gibraltar, per ss. "Soudan," September 14, 1909.—10926 Corporal E. Dover, 17015 Private A. Moore, 19744 Private R. W. Simmons, 934 Private F. Giles, 1076 Private F. C. Bowden, 1848 Private A. V. Martins, 509 Private W. H. J. Larrington, 1907 Private G. R. Lomas, 1980 Private F. Burden, 1956 Private P. H. Whidden.

To Egypt, per s.s. "Soudan," September 14, 1909.—10566 Quartermaster-Serjeant B. C. Dring, 10699 Staff-Serjeant B. D. Connolly, 12025 Serjeant A. C. Harrold, 19085 Private C. J. Vinton, 68 Private P. B. Chew, 1410 Private J. R. Pratt, 1432 Private R. May, 196 Private A. J. Kent, 957 Private H. A. Hunt, 1548 Private R. J. Paskell.

To Sierra Leone, per ss. "Batanga," September 23, 1909.—11327 Corporal M. K. Quinlan, 14761 Corporal W. Robertson.

To Malta, per H.T. "Rewa," September 30, 1909.—18868 Serjeant J. Mulcahy, 16323 Corporal W. McKenna, 246 Private H. Burns, 2112 Private W. E. Hickmott, 91 Private R. Bates, 19621 Private W. E. Kite.

To Hong Kong, per H.T. "Rewa," September 30, 1909.—Serjeant-Major E. Edser, 15288 Corporal W. C. Prince, 16446 Corporal W. Whitehead, 17573 Lance-Corporal C. Harlen, 17625 Lance-Corporal H. Walsh, 18137 Private J. W. Jones, 19446 Private D. Davies, 521 Private G. O. Triebroasser, 226 Private A. H. Wilks, 470 Private H. A. Claridge, 997 Private T. F. Corbett, 2070 Private A. Gibson.

To Singapore, per H.T. "Rewa," September 30, 1909.—15537 Lance-Corporal E. H. Jesson, 16051 Private W. McFarlane, 248 Private W. H. Burgess, 17003 Private O. R. Keeley, 989 Private R. S. Moore, 192 Private J. Murray, 210 Private R. Pearce.

To Egypt, per H.T. "Rewa," September 30, 1909.—15670 Serjeant F. W. Goodread, 874 Private F. A. Johnson.

To Ceylon, per H.T. "Rewa," September 30, 1909.—10047 Quartermaster-Serjeant C. A. Figg, 11450 Serjeant A. H. Owens, 14851 Serjeant C. B. Willsher, 15808 Serjeant C. Primer, 10861 Corporal G. Cleare, 17609 Lance-Corporal P. McDonnell, 11531 Private T. Sheehan, 198 Private A. V. Godsell, 1514 Private S. W. Harrod, 1868 Private E. B. Browne, 1919 Private F. H. Vyse, 1065 Private A. Dean.

*Disembarkations from Abroad.*—From Malta, per s.s. "Braemar Castle,"



October 8, 1909. — 16768 Private H. E. Barton, 12264 Serjeant W. G. Delamare, 11313 Corporal A. Bateman, 12650 Corporal E. Voyke, 17303 Lance-Corporal A. Auchterlonie, 18917 Lance-Corporal H. Chadwick, 17390 Lance-Corporal R. Cowx, 17541 Lance-Corporal P. McConn, 17726 Lance-Corporal C. P. Murphy, 18448 Private G. W. Aldons, 18002 Private W. Beard, 17001 Private D. Blair, 18049 Private O. G. Bloomfield, 18262 Private E. W. Clear, 18562 Private A. E. Coombes, 19007 Private J. R. Dare, 18015 Private W. H. Dixon, 17769 Private J. Evans, 18551 Private W. T. Foster, 18340 Private J. Rouse, 18258 Private H. Tempo, 18089 Private J. W. Thatcher, 17965 Private I. J. J. Thompson, 18289 Private L. Tweed, 17840 Private H. Walker, 18362 Private E. Watts, 18693 Private R. Williams, 18335 Private W. J. Woolway.

From Egypt, per ss. "Braemar Castle," October 8, 1909.—5772 Serjeant-Major E. Fry, 1832 Private H. Judd, 1967 Private H. J. Nixon, 17307 Private H. Beardsworth, 1203 Private A. W. Towcraker, 9861 Staff-Serjeant C. Malyon, 17844 Serjeant W. A. Clenshaw, 10762 Serjeant C. H. Edwards, 9433 Corporal S. W. Hawkes, 18984 Private B. Breeze, 1677 Private H. Green, 18379 Private A. White, 19433 Private H. Blake, 18897 Private W. Blakeman, 18898 Private G. H. Green, 18417 Private J. Knight, 19276 Private J. J. Young, 600 Private A. F. Day.

From Gibraltar, per ss. "Braemar Castle," October 8, 1909.—17751 Lance-Corporal T. F. Swann, 16835 Private J. H. Ferris, 18203 Private W. Hongaton, 18474 Private C. Keely, 17577 Private A. E. Lawrence, 17883 Private A. Highman.

**THE FOLLOWING N.C.O.'s AND MEN HAVE QUALIFIED FOR PROMOTION IN THE  
VARIOUS CORPS EXAMINATIONS.**

*For Quartermaster-Serjeant.*—9940 Staff-Serjeant F. Davis, 12386 Staff-Serjeant E. Purchase, 11173 Staff-Serjeant C. J. Hazell.

*For Staff-Serjeant.*—16227 Serjeant J. Ashworth, 16165 Serjeant P. Bullough, 16047 Serjeant P. Springut, 11896 Serjeant A. P. Spackman.

*For Serjeant.*—18253 Corporal J. Suter, 11690 Lance-Serjeant S. Sankey, 15027 Lance-Serjeant W. Bush.

**NOMINAL ROLL OF OFFICERS, WARRANT OFFICERS, N.C.O.'s, AND MEN  
WHO ATTENDED FIELD TRAINING OF 13TH COMPANY, ROYAL ARMY  
MEDICAL CORPS AT BARRY, 1909.**

*Officers.*—Major B. H. Scott; Captain F. McLennan; Lieutenants J. C. L. Hingston, F. H. Bradley, D. E. C. Pottinger, A. N. R. McNeill, J. A. Manifold, S. S. Dykes, and G. P. Taylor; Quartermaster and Honorary Captain H. S. Brook.

*Warrant Officers, N.C.O.'s, and Men.*—Serjeant-Major W. E. Hill; Serjeants A. E. Mendel, H. Secker, and J. Whiting; Corporals G. A. Austin, E. J. Gibson, D. Graham, F. W. Hine, and A. Langley; Lance-Corporal J. Moore; Privates H. Aley, J. Anderson, C. Bowen, A. E. Chasty, G. D. Christie, J. Claxton, S. C. Cox, G. Davies, W. H. Doling, W. Douglas, T. J. Ellis, M. Freeman, A. Gilchrist, F. Godfrey, W. Haddow, W. Hay, A. T. J. Healey, S. Holmes, J. A. Hubbling, C. A. T. Hughes, J. Jeffrey, W. Lintott, J. Loxley, A. Macleod, J. Mann, W. McDonald, J. McFarland, G. McGill, P. McLaughlin, W. Morey, W. R. Muir, C. Nagle, W. Neiser, W. J. Nunn, J. Percy, F. Powell, P. Renouf, D. J. Robertson, F. H. A. Rote, W. H. Sawyer, A. H. Scovell, W. J. A. Smith, A. Smith, J. Smyth, J. W. Taylor, J. Walkden, W. A. Walker, F. Wooding, R. Pattie, J. Timmons, Special Reserve (Royal Army Medical Corps), J. Corbett, Special Reserve (Royal Army Medical Corps).

**SPECIAL RESERVE OF OFFICERS.**

**ROYAL ARMY MEDICAL CORPS.**

*Supplementary List.*

Morton Wood Ruthven to be Lieutenant (on probation), dated August 12, 1909.

Thomas McEwen to be Lieutenant (on probation), dated August 13, 1909.

John Charles Hall, M.B., to be Lieutenant, dated August, 18, 1909.

Lieutenant M. Browne, from the Army Medical Reserve, to be Lieutenant, and to retain the rank and seniority which he held in the Army Medical Reserve, dated September 23, 1909.

**DURHAM ROYAL FIELD ARTILLERY.**

Surgeon-Lieutenant-Colonel James Rawlings resigns his commission and is granted permission to retain his rank and to wear the prescribed uniform, dated October 13, 1909.

**TERRITORIAL FORCE.****ROYAL ARMY MEDICAL CORPS.***For attachment to Units other than Medical Units.*

Harold Richard Moxon to be Lieutenant, dated June 18, 1909.

**ROYAL ARMY MEDICAL CORPS.***2nd London (City of London) Field Ambulance.*—Quartermaster and Honorary Lieutenant Alfred J. H. Knights is granted the honorary rank of Captain, dated April 28, 1909.*Attached to Units other than Medical Units.*

Lieutenant William Dyson, M.B., to be Captain, dated July 10, 1909.

Lieutenant Herbert M. Sylvester resigns his commission, dated August 20, 1909.

**UNATTACHED LIST FOR THE TERRITORIAL FORCE.**The announcement of the appointment to a Second Lieutenancy for service with the University of London Contingent, Senior Division, Officers' Training Corps, of Alfred Edward Johnson, M.B., which appeared in the *London Gazette* of July 16, 1909, is cancelled.

Alfred Edward Johnson, M.B., to be Lieutenant, for service with the Medical Unit of the University of London Contingent, Senior Division, Officers' Training Corps, dated July 1, 1909.

Gordon Clunes McKay Mathison, M.B., to be Lieutenant, for service with the Medical Unit of the University of London Contingent, Senior Division, Officers' Training Corps, dated July 1, 1909.

**ROYAL ARMY MEDICAL CORPS.***3rd Home Counties Field Ambulance.*—Quartermaster and Honorary Captain Martin Hewitt, retired pay (late Royal Army Medical Corps), to be Quartermaster, with the honorary rank of Captain, dated September 2, 1909.*2nd London Sanitary Company.*—Captain Peter Caldwell Smith, M.D., to be Major, dated September 8, 1909.*Attached to Units other than Medical Units.*

Lieutenant Alexander C. Farquharson, M.D., to be Captain, dated August 17, 1909.

Lieutenant Henry L. Gregory, M.B., to be Captain, dated August 24, 1909.

*For attachment to Units other than Medical Units.*

George Brittan Gill, M.B., to be Lieutenant, dated August 25, 1909.

Surgeon-Captain John A. Kendall, M.D., from the 9th Battalion, the Durham Light Infantry, to be Captain, dated September 1, 1909.

*King's Colonials.*—Surgeon-Lieutenant William S. Henderson, M.D., to be Surgeon-Captain, dated April 1, 1908.**ROYAL ARMY MEDICAL CORPS.***Attached to Units other than Medical Units.*

Lieutenant Alan Ayre-Smith, M.D., to be Captain, dated May 22, 1909.

Captain Edmund P. I. Coke resigns his commission, dated September 18, 1909.

**ROYAL ARMY MEDICAL CORPS.***1st Welsh Field Ambulance.*—Lieutenant Thomas Smyth resigns his commission, dated September 3, 1909.*3rd Wessex Field Ambulance.*—Captain Herbert J. Goodwin resigns his commission, dated August 25, 1909.*1st Western General Hospital.*—Llewellyn Arthur Morgan, M.D., to be Captain, whose services will be available on mobilisation, dated September 22, 1909.*For attachment to Units other than Medical Units.*

John Orton Hollick, M.B., to be Lieutenant, dated August 12, 1909.

**ROYAL ARMY MEDICAL CORPS.***3rd London (City of London) Field Ambulance.*—Reginald Martin Vick to be Lieutenant (to be supernumerary), dated July 23, 1909.

*For attachment to Units other than Medical Units.*

Lieutenant Henry S. Walker to be Captain, dated April 1, 1908.

Surgeon-Major James Harris Garcia Whiteford, M.B., from the Clyde Division (Electrical Engineers), Royal Engineers (Volunteers), to be Major, with precedence as in the Volunteer Force, dated April 1, 1908.

Surgeon-Captain John Rowan, M.B., from the Clyde Division (Electrical Engineers), Royal Engineers (Volunteers), to be Captain, with precedence as in the Volunteer Force, dated April 1, 1908.

**UNATTACHED LIST FOR THE TERRITORIAL FORCE.**

Quartermaster Brooke Heckstall Smith, from the London District, London Companies, R.A.M.C. (Volunteers), to be Quartermaster, with the honorary rank of Lieutenant, with precedence as in the Volunteer Force, dated April 1, 1908.

Quartermaster and Honorary Lieutenant Brooke H. Smith is granted the honorary rank of Captain, dated May 10, 1909.

*5th Battalion, the Sherwood Foresters (Nottinghamshire and Derbyshire Regiment).*—Surgeon-Major Edmund Vaudrey, M.D., resigns his commission, and is granted permission to retain his rank, and to wear the prescribed uniform, dated August 24, 1909.

**VOLUNTEER CORPS.**

**ROYAL ARMY MEDICAL CORPS (VOLUNTEERS).**

*London District, London Companies.*—Captain Charles T. D. Urquhart, M.B., resigns his commission, dated March 31, 1908.

**ROYAL GARRISON ARTILLERY VOLUNTEERS.**

*1st Carnarvonshire.*—Surgeon-Lieutenant-Colonel and Honorary Surgeon-Colonel Edward J. Lloyd, M.D., resigns his commission, and is granted permission to retain his rank, and to wear the prescribed uniform, dated March 31, 1908.

**WITH THE OFFICERS' TRAINING CORPS, UNIVERSITY OF LONDON, IN CAMP.**

(*"St. Bartholomew's Hospital Journal,"* October, 1909).

On Friday, July 30, the University of London Officers' Training Corps went for its first training in camp on Salisbury Plain. Our readers will be more interested in the doings of the Medical unit, and with them we shall be more concerned, but, as the Medical unit is only a part of the contingent, it will not be out of place to say a word about the Corps as a whole.

The Corps consists of—

- (1) *An Engineer unit*, 76 strong.
- (2) *An Infantry unit* of 6 companies, 302 strong.
- (3) *A Medical unit* of 3 sections.

*A Section.*—Headquarters in St. Bartholomew's Hospital, including cadets from St. Bartholomew's, London, King's College, and Charing Cross Hospitals; 59 strong.

*B Section.*—Headquarters, Guy's Hospital, including cadets from Guy's and St. Thomas's Hospital; 74 strong.

*C Section.*—Headquarters, University College Hospital, including cadets from University College and the Middlesex Hospitals; 84 strong.

The strength of the Medical unit is 217, and the total strength of the Corps is 596.

The officers are mostly men holding teaching appointments in the constituent Colleges of the University. Those attached to "A" Section are Majors Herringham and Tooth and Lieutenant Charlton Briscoe, of King's.

The Adjutant is Captain A. G. Egerton, Coldstream Guards, who has won the esteem of everybody.

Lieutenant T. Ll. Humberstone, who is the Secretary of the Military Education Committee, is the Quartermaster.

There are five very efficient Serjeant-Instructors, two of whom belong to the Royal Army Medical Corps.

"A" Section of the Medical unit was fortunate in possessing four very smart and experienced Serjeants in Morse, Capon, and Greaves, of St. Bartholomew's Hospital, and Brown, of King's. The Section owed a great deal to their unremitting care and attention.

It will therefore be evident that the University has responded to the call of duty and is training a goodly contingent of young men to supply the shortage of officers in

the event of a great war in three important branches of the Service. It is to be hoped that these numbers will at least double themselves in the coming year.

Four days before the main body entrained an advance body of some fifty cadets, under the command of Captain Charles, went down to the Plain to pitch the camp, which was situated on a commanding site on West Down North, about six miles from the G.W.R. Station, Lavington. This party did their work admirably, and the camp was pitched with a smartness and precision worthy of Regular troops. So willing and energetic were the fatigue parties that the Ordnance Store officer remarked that he had never seen stores handled more expeditiously even by Regulars.

After the first two days the weather became all that could be desired, brilliant sunshine all day and almost tropical heat, but delightfully cool nights.

The health of the contingent, and particularly of the Medical unit, was very good, and the really hard work in blazing sun resulted in only one or two slight casualties. There was an excellent spirit among the cadets generally, and a desire to make the best of the time for training, all too short anyway. The full time was fifteen days, and the larger number stayed for this, but among the medicals about a third went at half time, which is much to be regretted, for there is much to learn, and a man who goes at the end of the first week must lose much instruction and experience that could not be crowded into a week. It would not be possible nor advisable to make the second week a simple repetition of the first.

It is well perhaps to insist that the training is not a holiday, but a time for really hard work—bodily and mentally—and requiring a man's full energy if he is going to get any real good out of it.

Now for a short review of the work done by the Medical unit. The idea underlying the training is to teach the cadets the soldiering side of the Royal Army Medical Corps; the medical and surgical teaching, of course, is the duty of their hospital, and in such a training as this is left alone; in fact, a number of the men are not yet out of the dissecting room, and therefore quite unfit for any but the most elementary first-aid work. Cadets are working for an examination for Certificate A, which requires a very elementary knowledge of anatomy, together with squad and company drill, and the handling of bodies of men, which every officer must know. Indeed, a good deal of the time of training was given to perfecting the men in company drill, and it was not time thrown away. Men were also called out from the ranks to take command of squads or companies, and there is no other way of learning to command. Stretcher drill, the intelligent handling of wounded men, the loading and unloading of ambulance wagons, the behaviour of stretcher-bearers in the field—all require practice and an amount of drill detail which at first sight seems unnecessary.

*Reveille* was at 6 a.m., and there was half an hour's drill before breakfast. Tents cleaned and kits piled ready for inspection. Breakfast, 7.30. Line inspection at 8.30. General fall-in for parade and roll call at 8.40. Except on field days the three sections then marched off to their parade ground for drill, the sections working independently. At 11 a.m., except on field days, there was a lecture or demonstration. The lectures were by Major Stammers, R.A.M.C., on "Camp Sanitation, Water Supply, Purification and Filtration"; by Colonel James on "General Plan and Scope of Field Ambulances, and Details of Equipment." Captain Egerton, Coldstream Guards, Adjutant, Officers' Training Corps, kindly gave a lecture on "Map Reading." Demonstrations also by Colonel James on "Equipment of Field Ambulances and Pitching of Tents."

From 12 to 2 there was a break-off for lunch and rest.

At 2 p.m. fall-in again for drill and exercise, tent pitching, &c.

4.30.—Tea. 5 to 7.—Recreation, cricket, football.

Lights out at 10.15.

In sports the medical unit distinguished itself by winning the Rugby and Association football. In cricket the match, Contingent *v.* Inns of Court, was won largely by the excellent batting of Captain Egerton (Adjutant) and F. T. Hill, "A" Section Medical. In the athletic sports the Medical unit proved very strong; in fact, they won all the events, and of these "A" Section won the mile—R. H. Hodges, King's; obstacle race, Corporal E. A. P. Brook, St. Bart's. On three evenings there was a concert on the parade ground, in which the officers took part. Cadet Steuart's recitation, and Sergeant Morse's "Come, Landlord, fill the Flowing Bowl," were both excellent, and it was here that the Officers' Training Corps song first saw the light. Few of those present will forget these sing-songs under moon and stars of almost tropical brilliancy.

But to return to the work. One half-day was given to actual hard spade work—the digging of latrines, incinerators, slop, refuse, and urine pits and camp kitchens, the practical illustration of the lectures. Not the least arduous of the duties was the filling up of the trenches and holes on a subsequent occasion, and the replacing of the sods.

On four occasions the whole unit went out as a complete section of a field ambulance, under the command of Major Herringham. It was then that the effect of many wearisome drills and exercises showed itself in the alertness and smartness of the cadets, and the smooth working of the whole unit. The work, shortly, consists of a march out to the field of action, in so-called column of route, with ambulance wagons, army service wagons, water-cart, and all the equipment necessary for the establishment of a collecting station not far from the firing line, a dressing station some little way behind this, and a "tent division camp" with tents for the wounded, operation tent, kitchens, and bivouacs for officers and men, pitched in a comparatively safe place. These three elements of the Field Ambulance in action must be in communication by signallers and cyclists. Bearer squads of six men each are continually going to fetch wounded men from the firing line and bringing them back to the collecting station, where trivial wounds are at once attended to, and the more serious sent back in ambulance wagons to the dressing station, which is better equipped for treatment, but the cases which require more elaborate surgical treatment are sent back further to the tent division.

All this work was rehearsed, and to the great instruction of all—officers and men.

This, important as it is, forms only a part of the Royal Army Medical Corps officer's duties. He has to learn all about the equipment of station hospitals and base hospitals, and the duties of an officer generally, involving knowledge of military law, war establishments, and the general organisation of the Army in peace and war. These will form the subjects of the examination for Certificate B.

A cadet who has obtained Certificate B can, after qualification, take a commission in the Territorial Royal Army Medical Corps, or, if he elects to enter the Regular Royal Army Medical Corps, he gets certain very tangible advantages, and it is hoped that the Officers' Training Corps may become a popular gate of entrance into the Regular service.

But, failing this, it is very desirable, nay essential, that our cadets should eventually enter the "Special Reserve of Officers." It is by the future strength of this body that the real success of the Officers' Training Corps will be gauged, for this, the Reserve which engages to serve abroad on emergencies, is, next to the Regular Army, the most important Corps in the Service. If it is filled we shall have trained officers to depend upon in the next war. If it is not, we shall again, as in the Boer War, have to enlist a lot of untrained civilians who know nothing of soldiering, and, in consequence, cannot do half of the things which form the daily work of an officer in the Royal Army Medical Corps.

In conclusion, it is earnestly hoped that our freshmen will be so alive to their duty to the country as to enter the Corps as soon as possible after entering the Hospital. We believe that they will not regret the step.

H. H. T.

#### **MOUNTED BRIGADE FIELD AMBULANCE NOTES.**

FROM LOWLAND DIVISION, R.A.M.C (T.F.).

Colonel R. T. Halliday, commanding the Mounted Brigade Field Ambulance, has arranged a series of most interesting lectures for officers and N.C.O.'s of his unit, on the first Tuesday of each month. The opening lecture was given at the headquarters in Royal Terrace, when Captain F. T. Reid, the officer in charge of the Army Service Corps, Maryhill, dealt with "Supplies and Transport in Peace and War." Officers of other medical units and regimental medical officers were invited to attend. Captain Reid dealt with rations in camp, fuel and forage, methods of indenting, Army forms and carriers' notes, and gave a number of useful, practical hints, which were much appreciated. He also dealt with rations on service, the transport and supply column, and the first, second, and third line transport. The series of lectures will include subjects outside the usual routine of the training of the unit, such as "Maps and Map-Reading," "Military Law," &c., and should be of practical value to the officers attending.

#### **QUEEN ALEXANDRA'S IMPERIAL MILITARY NURSING SERVICE.**

The following ladies have received appointments as Staff Nurses: Miss J. D. C. McPherson, Miss M. L. Cutfield, Miss A. G. Airey, Miss E. Schafer, Miss G. E. Stewart.

*Postings and Transfers.*—Matrons: Miss S. E. Oram, R.R.C., to Malta, from Cambridge Hospital, Aldershot; Miss G. M. Payne, R.R.C., to Devonport, on arrival from Egypt; Miss H. W. Reid, to Cambridge Hospital, Aldershot, from Cosham; Miss L. W. Tulloh, R.R.C., to Hong Kong, from Devonport; Miss M. C. S. Knox, R.R.C.,

to Bloemfontein, from Potchefstroom. Sisters: Miss A. Guthrie, to Cambridge Hospital, Aldershot, from Netley; Miss S. Lamming, to Netley, from Cambridge Hospital, Aldershot; Miss M. Mark, as Acting Matron, to t.s. "Plassy," for duty, from Woolwich; Miss A. Willes, to t.s. "Plassy," for duty, from Woolwich; Miss E. C. Stewart, to Bloemfontein, from Potchefstroom; Miss A. A. Wilson, to Bloemfontein, from Middelburg; Miss M. Walker, to Pretoria, from Bloemfontein; Miss M. E. Harper, R.R.C., to Dublin, on return from South Africa; Miss A. M. MacCormac, to Connaught Hospital, Aldershot, on arrival from Malta; Miss M. E. Wilkin, to Dublin, on arrival from Malta; Miss F. N. Roberts, to Curragh, from Dublin; Miss S. B. Lanyon, to Dublin, from Curragh; Miss S. O. Beamish, to Curragh, from York; Miss H. M. Drage, to Hong Kong, from Cambridge Hospital, Aldershot; Miss L. M. Toller, to Hong Kong, from Connaught Hospital, Aldershot; Miss F. G. P. de Stourdza Zrinyi, to Hong Kong, from Dublin. Staff Nurses: Miss M. Willes, to t.s. "Plassy," for duty, from Colchester; Miss A. M. Phillips, to Malta, from Netley; Miss S. G. M. Rogers, to Malta, from York; Miss A. Lee, to Dover, from Cosham; Miss K. F. Fawcett, to Cosham, from London; Miss N. Parke, to Shorncliffe, from Cambridge Hospital, Aldershot; Miss J. Findlater, to Netley, on appointment; Miss F. McClelland, to York, from London; Miss A. J. St. Clair, to Hong Kong, from Curragh; Miss M. E. Brewer, to Hong Kong, from London; Miss M. S. Williams, to Hong Kong, from Woolwich; Miss E. A. Harvey, to Hong Kong, from Devonport; Miss D. A. Scott, to Cambridge Hospital, Aldershot, on appointment; Miss M. L. Cutfield, to London, on appointment; Miss M. Clayden, to London, on appointment; Miss E. Schafer, to Woolwich, on appointment; Miss A. G. Airey, to Cosham, on appointment; Miss G. E. Stewart, to Chatham, on appointment; Miss G. H. Sellar, to Curragh, from Netley.

*Arrivals.*—Miss G. M. Payne, R.R.C., Matron, from Egypt; Miss A. M. MacCormac, Sister, from Malta; Miss M. E. Wilkin, Sister, from Malta.

*Appointments Confirmed.*—Miss C. E. Alldridge, Miss E. B. Black, Miss M. Black, Miss K. C. P. H. Brewer, Miss W. M. Gedye, Miss M. O. Greenaway, Miss A. L. Plimsaul, Miss O. F. Stinton, Miss M. E. Stewart, Miss A. C. W. Teevan.

## ARMY MEDICAL OFFICERS' BENEVOLENT SOCIETY.

PROCEEDINGS OF A COMMITTEE MEETING HELD AT THE WAR OFFICE ON MONDAY,  
OCTOBER 18, 1909, AT 3.30 P.M.

### *Present:*

Colonel J. Lane Notter, in the chair.  
Lieutenant-Colonel E. M. Wilson, C.B., C.M.G., D.S.O.  
Lieutenant-Colonel R. H. Firth.  
Major C. G. Spencer.  
Major E. T. F. Birrell.

(1) The minutes of the last meeting were read and confirmed.

(2) It was resolved to make the following grants:—

(a) The orphan son of the late Major P. G., £30.

(b) The orphan daughter of the late Captain F. (as a special case), £12.

(3) It was decided that the widow of the late Quartermaster Mc.S. was not eligible for a grant.

(4) Colonel A. Peterkin was elected a member of the Committee, *vice* Colonel Seymour, who resigned.

(5) It was noted that a donation of £14 2s. 11d. has been received from the Officers' Mess, Middelburg, Cape Colony.

# ROYAL ARMY MEDICAL CORPS FUND.

PROCEEDINGS OF A COMMITTEE MEETING HELD AT THE WAR OFFICE, OCTOBER 18, 1909.

## Present :

Surgeon-General W. L. Gubbins, C.B., M.V.O., in the chair.

Colonel Sir James Clark, C.B., Bart.

Colonel D. Wardrop, C.V.O.

Colonel H. E. R. James.

Colonel A. Peterkin.

Lieutenant-Colonel E. O. Wight.

Major G. G. Spencer.

Major E. T. F. Birrell.

Major A. Bruce.

Captain Delap, D.S.O.

(1) The minutes of the last meeting were read and confirmed.

(2) *Band*.—The Aldershot Band accounts were considered and past, and a sum of £66 was voted for the current quarter's expenses. The accounts are attached to the minutes.

(3) *General Relief Fund*.—It was noted that the following grants have been received from Companies for the quarter ending September 30, 1909 :—

					£	s.	d.
No. 6 Company	..	..	..	Portsmouth	..	5	0 0
" 11	"	"	"	Dover	..	4	9 2
" 15	"	"	"	Belfast	..	7	0 0
" 16	"	"	"	Cork	..	5	0 0
" 17	"	"	"	Curragh	..	5	0 0
" 19	"	"	"	Chester	..	4	8 0
" 20	"	"	"	Ceylon	..	5	0 0
" 28	"	"	"	Gibraltar	..	3	0 0
" 29	"	"	"	Jamaica	..	2	0 0
" 30	"	"	"	Malta	..	10	0 0
" 33	"	"	"	Cairo	..	5	0 0
Detachment Middelburg, Gape Colony	..	..	..		..	26	16 0
Curragh Field Ambulance	..	..	..		..	5	5 6
Total ..					..	£87	18 2

(4) The grants made from the General Relief Fund for the past quarter were confirmed, and a list of the recipients is appended to these minutes.

(5) *Memorials*.—A sum of £10 was sanctioned for restoring a memorial picture.

(6) A letter was read from the Chelsea Commissioners regarding the commutation of part of the pension of a late Warrant Officer, Royal Army Medical Corps, and considered. The Committee decided that they were unable to give an opinion on the matter.

(7) The adjourned discussion on giving a grant to the London Soldiers' Home was again considered, and the Committee decided that there was no need to give a grant to this home, as the men of the Corps were amply provided for in the Union Jack Club.

(8) *Schools*.—It was noted that the following children have been admitted to the Royal Soldiers' Daughters' Home, on payment of £19 per annum each :—

*Girl* Ivy H.

" E. G. S. P.

(9) It was resolved that Majors Spencer and Birrell and the Secretary be appointed a Sub-Committee to decide what old correspondence may be destroyed.

(10) A letter was read from Surgeon-General Kenny calling attention to the fact that there is no head-stone to the grave of a late Royal Army Medical Corps officer who died in Natal during the late South African War. The Secretary stated that last year he wrote to the widow of the officer about this, and she promised she would have a head-stone erected. It was resolved that the widow be again written to and informed that

BALANCE SHEET FOR THE QUARTER ENDING SEPTEMBER 30, 1909.

ESTIMATE FOR THE QUARTER ENDING DECEMBER 31, 1909.

A sum of £65 will be required.



if she would pay half the expenses of a head-stone, the Committee would defray the other half.

(11) A letter was read from Surgeon-General Sir Thomas Gallwey suggesting that the Band President should be *ex-officio* a member of the Committee, as representing the junior officers. This question was fully discussed, and on reference to previous minutes it was found that in the constitution of the Committee a junior officer should be nominated by the junior officers at Aldershot as their representative; therefore, unless the Band President was himself a junior officer, and also nominated as their representative by the other junior officers, he could not be *ex-officio* a member of the Committee, though there is no reason why in future the Band President should not be nominated by the junior officers as their representative.

(12) The question of change of the office was adjourned until the next meeting.

### ROYAL ARMY MEDICAL CORPS FUND.

RECIPIENTS OF GENERAL RELIEF FOR THE QUARTER ENDING SEPTEMBER 30, 1909.

Name	Age	District	Grant	Total	Remarks
Mr. W. H. N. . .	43	London ..	£4	£62	Almost blind. Cannot work. One child.
Mrs. S. . .	67	„ ..	£4	£48	Too old to work.
Mr. R. R. . .	47	Aldershot..	£2	£2	To meet an urgent business call.
Mrs. E. P. . .	43	Portsmouth	£4	£14	Four children to support.
Mr. J. E. B. . .	24	London ..	£1	£1	Destitute and out of work.
Mrs. A. B. . .	42	Dublin ..	£3	£22	Two young children to support.
Mr. J. H. . .	46	Chatham ..	£4	£4	Is a chronic invalid, unable to work. Four children.
Mr. F. A. L. . .	38	Portsmouth	£4	£4	Is a chronic invalid with six children.
Mrs. E. L. P. . .	34	London ..	£4	£4	Has two children, one a baby.
Mr. C. M. . .	30	„ ..	10s.	10s.	Destitute and out of work.
Mrs. M. S. . .	40	Aldershot..	£3	£9	Six children to support.
Mr. W. W. . .	28	Edinburgh	£2	£4	Out of work. Three children.
Mr. J. W. . .	46	Aldershot	£3	£3	(Died.) For funeral and other expenses.
Mr. J. G. . .	43	Colchester	£4	£4	Suffers from tuberculosis. Unfit to work. Three children.

### BIRTHS.

COLLINGWOOD.—On October 2, at Hong Kong, the wife of Captain P. H. Collingwood, R.A.M.C., of a daughter.

GERRARD.—At 28, Church Road, Richmond, Surrey, on October 5, the wife of Lieutenant-Colonel J. J. Gerrard, of a son.

### MARRIAGE.

MACKESSACK—COLEMAN.—On August 11, at St. Clement's Church, Curepipe, Mauritius, by the Venerable Archdeacon Clinton, Major P. Mackessack, R.A.M.C., to Margaret, daughter of the late Alfred Coleman, F.R.C.S., and of Mrs. Coleman, 9, Iverna Gardens, Kensington, W.

## DEATHS.

**HOOPER.**—On August 25, 1909, Surgeon-Major Lucas George Hooper, A.M.D. (Half Pay), aged 78. He entered the Service on April 28, 1854; served in the 17th Foot and 10th Hussars; became Surgeon (Staff), June 20, 1865; Surgeon-Major, Army Medical Department, March 1, 1873; and retired on half pay February 15, 1877. His war service was as follows: Crimea, including siege and fall of Sebastapol. Medal and clasp; Turkish medal.

**WARD.**—On September 29, 1909, Honorary Brigade-Surgeon William Pearson Ward, A.M.D. (Half Pay). He entered the Service June 14, 1847; became Surgeon, 17th Foot, June 26, 1855; Surgeon, Royal Artillery, June 1, 1860; Surgeon-Major, Royal Artillery, June 14, 1867; Surgeon-Major, Army Medical Department, March 1, 1873; and retired on half pay with the honorary rank of Brigade-Surgeon, February 27, 1880. His war service was: Crimea, 1854 and 1855, including the affair of McKenzies' Farm; Battles of Alma, Inkerman, and Balaclava; seige and fall of Sebastapol, and assault on the Redan, September 8. Medal and four clasps, Legion of Honour, and Turkish Medal.

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## EXCHANGES, &c.

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25	4	0 3 0	0 1 3	4 0	1 3	3 6	0 9
	8	0 5 6	0 2 6				
	16	0 9 6	0 4 6				
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	16	0 12 0	0 5 3				
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	8	0 9 0	0 4 4				
	16	0 16 9	0 6 9				
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	8	0 13 6	0 6 0				
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## Notices.

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### EDITORIAL NOTICES.

The Editor will be glad to receive original communications upon professional subjects, travel, and personal experiences, &c. He will also be glad to receive items of news and information regarding matters of interest to the Corps from the various garrisons, districts, and commands at home and abroad.

**All such Communications or Articles accepted and published in the "Journal of the Royal Army Medical Corps" will (unless the Author notified at the time of submission that he reserves the copyright of the Article to himself) become the property of the Library and Journal Committee, who will exercise full copyright powers concerning such Articles.**

Matter intended for the Corps News should reach the Editor not later than the 15th of each month for the following month's issue. Notices of Births, Marriages, and Deaths are inserted free of charge to subscribers and members of the Corps. All these communications should be written upon one side of the paper only; they should by preference be type-written, but, if not, all proper names should be written in capital letters (or printed) to avoid mistakes, and be addressed The Editor, "JOURNAL OF THE ROYAL ARMY MEDICAL CORPS," War Office, Whitehall, London, S. W.

Communications have been received from Major F. J. N. Porter, Captain N. E. Harding, Lieutenant-Colonel W. A. Morris, Captain R. Tilbury Brown, Captain J. H. Barbour, Colonel O. E. P. Lloyd, Major F. J. Wade-Brown, Captain H. B. Walton, Major A. P. Blenkinsop, Major W. H. Horrocks, Captain N. T. C. Rutherford, Major H. A. L. Howell, Major R. F. E. Austin, Lieutenant-Colonel R. T. Halliday, R.A.M.C. (T.F.), Captain H. G. Anderson, Lieutenant-Colonel R. H. Firth, Captain J. C. G. Carmichael, Major N. Faichnie, Major K. B. Barnett, Lieutenant C. M. Rigby, Captain H. Ensor, Major J. B. Anderson, Captain H. G. Sherren.

The following publications have been received :—

*British: Army and Navy Gazette, The Hospital, Journal of the Royal Sanitary Institute, The Medical Review, The Lancet, The Royal Engineers' Journal, Travel and Exploration, The Indian Medical Gazette, The Australasian Medical Gazette, Medical Press and Circular, The Practitioner, Guy's Hospital Gazette, The Natal Agricultural Journal, Public Health, On the March, Red Cross and Ambulance News, St. Bartholomew's Hospital Journal, The British Journal of Tuberculosis, The All-India Hospital Assistants' Journal, Proceedings of the Royal Society of Medicine, Journal of the Royal United Service Institution, St. Thomas's Hospital Gazette, Progress Report on the Uganda S.S. Camps, Sleeping Sickness Bureau, The Cavalry Journal.*

*Foreign: Archives de Médecine et de Pharmacie Militaires, Norsk Tidsskrift for Militærmedicin, Bulletin de l'Institut Pasteur, Revista de Sanidad Militar y La Medicina Militar Española, Boletín de Sanidad Militar, Le Caducée, Archiv für Schiffs- und Tropen-Hygiene, Russian Medical Journal, Militärgeographie, Japanese Journal, Militærlægen, Tidsskrift I Militær Hælsøvers, U.S. Department of Agriculture, Annali de Medicina Navale E Coloniale.*

## MANAGER'S NOTICES.

The **JOURNAL OF THE ROYAL ARMY MEDICAL CORPS** is published monthly, six months constituting one volume, a volume commencing on 1st July and 1st January of each year.

The Annual Subscription is £1 (which includes postage), and should commence either on 1st July or 1st January; but if a subscriber wishes to commence at any other month he may do so by paying for the odd months between 1st July and 1st January at the rate of 1s. 8d. (one shilling and eightpence) per copy. (All subscriptions are payable in advance.)

Single copies can be obtained at the rate of 2s. per copy.

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**Officers of the Royal Army Medical Corps possessing Diplomas in Public Health, &c., are kindly requested to register their special qualifications at Headquarters. Letters of complaint are frequently received from officers stating that their special qualifications have not been shown in the Distribution List which is published as a supplement to the Journal in January and July of each year. As, however, the particulars of this list are supplied from official sources, officers are reminded that unless the possession of Diplomas, &c., has been registered at Headquarters, no entry of such qualifications can be recorded in the Distribution List.**

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WAR OFFICE, WHITEHALL, S.W.

# JOURNAL OF THE ROYAL ARMY MEDICAL CORPS.

## Corps News.

DECEMBER, 1909.

### ARMY MEDICAL SERVICE.

#### GRENADIER GUARDS.

Brigade-Surgeon-Lieutenant-Colonel and Brevet-Colonel Charles E. Harrison, C.V.O., M.B., Honorary Surgeon to the King, is placed on retired pay, dated October 19, 1909.

#### ESTABLISHMENTS.

##### ROYAL ARMY MEDICAL CORPS SCHOOL OF INSTRUCTION.

Lieutenant-Colonel George D. Hunter, D.S.O., R.A.M.C., to be Commandant *vice* Lieutenant-Colonel C. E. Nichol, D.S.O., M.B., dated November 1, 1909.

#### ROYAL ARMY MEDICAL CORPS.

Captain Francis S. Irvine, from the seconded list, is restored to the establishment, dated October 13, 1909.

Lieutenant William E. Marshall, M.B., is seconded for Service with the Egyptian Army, dated October 14, 1909.

The undermentioned Captains to be Majors, dated October 23, 1909: Brian Watts; Henry G. Martin; Frederick F. Carroll, M.B.; John D. G. Macpherson, M.B.; William P. Gwynn; Standish de C. O'Grady, M.B.; Augustus H. O. Young; Ernest A. Bourke; Montagu M. Lowsley; Gerald B. Carter, M.B.; Norman H. Ross, M.B.

Captain Arthur C. H. Gray, M.B., from the seconded list, is restored to the establishment, dated October 25, 1909.

The undermentioned Lieutenant-Colonel to be Brevet-Colonel: Robert H. Firth, R.A.M.C., under the provisions of Articles 35 and 307 of the Royal Warrant for Pay and Promotion, 1907, dated November 10, 1909.

**INCREASED PAY.**—Lieutenant-Colonel G. Wilson, M.B., has been specially selected for increased pay under Article 317 of the Royal Warrant for Pay and Promotion, 1907, from October 19, 1909, inclusive.

**ARRIVALS HOME TOUR EXPIRED.**—From India: Lieutenant-Colonel J. R. Forrest; Majors E. A. Burnside, R. C. Thacker, and E. S. Clark. From West Coast Africa: Captains A. M. MacLaughlin, M.B., F. W. Cotton and T. E. Fielding. From India: Captains B. J. Patch and W. MacDowell. From Malta: Captain H. C. Winckworth.

**EMBARKATIONS.**—For South Africa: Lieutenant-Colonel R. Caldwell; Major J. Poe and Captain A. C. Vidal. For Indian Northern Army: Lieutenant-Colonels S. C. Philson and S. R. Wills; Captains W. Davis and R. F. Ellery. For Indian Southern Army: Majors H. O. B. Brown Mason and O. L. Robinson; Captain H. Simpson; Lieutenant M. P. Leahy.

**TRANSFERRED TO HOME ESTABLISHMENT.**—Captain C. R. Sylvester-Bradley.

**POSTINGS.**—Irish Command: Lieutenant-Colonel J. R. Forrest. Northern Command: Lieutenant-Colonel J. J. Gerrard. Southern Command: Major E. A. Burnside. Irish Command: Majors R. C. Thacker, A. F. Tyrrell and E. S. Clark. Northern Command: Major M. Boyle. Irish Command: Captain B. J. Patch. Eastern Command: Captain C. R. Sylvester-Bradley. Irish Command: Captains W. MacDowell and H. C. Winckworth.

**APPOINTMENTS.**—Colonel T. M. Corker, M.D., Principal Medical Officer, Egypt; Brevet-Colonel T. P. Woodhouse, Principal Medical Officer, Scottish Command; Lieutenant-Colonel G. D. Hunter, D.S.O., Commandant Royal Army Medical Corps School of Instruction; Lieutenant-Colonel J. J. Gerrard, M.B., Medical Inspector of Recruits, Scottish Command; Major J. C. Morgan, Sanitary Officer, Irish Command; Major S. G. Moores, Staff Officer to Principal Medical Officer, Aldershot Command; Major J. H. E. Austin, Recruiting Medical Officer, London District; Major S. L. Cummings, Duty in Department of the Professor of Pathology at the Royal Army Medical College; Major C. W. Duggan, R.P., Medical Charge at Lincoln.

Lieutenant-Colonel T. H. F. Clarkson's appointment at the Tower of London has been extended for one year as a special case.

The tour on the West Coast of Africa will in future be made up as follows: One year on the Coast followed by six months leave, then a second year on the Coast followed by another period of six months' leave. Double service for pension will be reckoned for the actual periods on the Coast, *i.e.*, two years on the Coast will count as four towards retirement.

The following Retired Pay appointments are vacant: Landguard Fort, Scarborough, Fort Stamford, Shrewsbury, Recruiting Belfast.

Captain T. P. Johnson, R.A.M.C., has been awarded the "Luke Armstrong Scholarship," in Comparative Pathology by the University of Durham College of Medicine.

Major H. G. Cummins, R.A.M.C. (retired pay), has been appointed Professor of Botany and Agriculture in University College, Cork.

*Diploma.*—Captain O. W. A. Elsner has obtained the Diploma in Public Health of the Royal College of Physicians and Surgeons, Ireland (November, 1909).

#### RESULTS OF EXAMINATION OF LIEUTENANTS, R.A.M.C.

The following results of examinations are notified for general information:—

Passed in (b) for rank of Captain: J. A. B. Sim, M.B.; C. T. Conyngham, M.B.; J. W. Houston, M.B.; A. L. Stevenson, M.B.; F. M. Hewson; T. S. Eves, M.B.

Passed in (h): W. F. M. Longman; J. L. Wood.

#### PROMOTIONS.

The following promotions, to complete establishment, will take effect from the dates specified:—

##### *To be Serjeant-Majors.*

No.	Rank and Name	Date	Section	Remarks
9258	Qmr.-Serjt. E. O'Hara ..	13.8.09	..	Vice A. T. Green, to pension.
9684	.. A. G. Tod ..	1.9.09	..	From Supernumerary List under Colonial Government, <i>vice</i> W. H. Taylor, to pension.
9579	.. C. F. Houston	16.9.09	..	From Supernumerary List at War Office, <i>vice</i> B. S. Gledhill, to pension.
8704	.. T. J. Tilbrook	25.9.09	..	Vice E. V. Saunders, to H.M. Commission.
8821	.. J. Jackson ..	29.10.09	..	Vice C. E. Phillips, to pension.

##### *To be Quartermaster-Serjeants.*

8609	Staff-Serjt. G. Cookson ..	13.8.09	..	Vice E. O'Hara, promoted.
9929	.. J. Banks ..	1.9.09	..	.. F. H. Dolman, to pension.
9515	.. R. J. Fleming	7.9.09	..	.. J. R. Konshole, to pension.
11000	.. W. H. Storey	8.9.09	..	.. R. Moffatt, to pension.
9940	.. F. Davis ..	25.9.09	..	.. T. J. Tilbrook, promoted.

*To be Staff-Serjeants.*

No.	Rank and Name	Date	Section	Remarks
19635	Serjt. J. O'Connor ..	8.7.09	..	Vice C. J. Stroud, to Territorial Forces.
10333	„ T. Martin ..	9.8.09	..	„ H. Kirton, to pension.
10892	„ H. J. Reeve ..	9.8.09	..	„ T. Martin, Supernumerary with Territorial Forces.
11509	„ J. J. Earp ..	13.8.09	..	„ G. Cookson, promoted.
10900	„ A. C. Andrews ..	26.8.09	..	„ G. Read, to Territorial Forces.
10849	„ C. E. T. Richmond	1.9.09	..	„ J. Banks, promoted.
10710	„ J. Moore ..	1.9.09	..	„ C. E. T. Richmond, Supernumerary with Territorial Forces
10276	„ F. Bird ..	1.9.09	..	„ J. Moore, Supernumerary with Colonial Government
10590	„ J. W. Elliott ..	7.9.09	..	„ R. J. Fleming, promoted.
11627	„ H. Secker..	8.9.09	..	„ W. H. Storey, promoted.
8137	„ T. French ..	18.9.09	..	Under para. 351, King's Regulations, Supernumerary with Territorial Forces.
17901	„ G. P. Jones ..	25.9.09	..	Vice F. Davis, promoted.
11223	„ J. F. Hampton ..	1.10.09	..	„ A. Fletcher, to Territorial Forces

*To be Serjeants.*

17159	Lce.-Serjt. C. Jones ..	8.7.09	General Duty	Vice J. O'Connor, promoted.
16569	„ E. Attfield ..	9.8.09	Nursing ..	„ T. Newling, to Territorial Forces.
14326	„ W. P. S. Morman	9.8.09	„ ..	„ H. J. Reeve, promoted.
18453	„ F. A. Philbrook	13.8.09	„ ..	„ J. J. Earp promoted.
16524	„ H. Fandam..	16.8.09	Clerical ..	„ W. J. Hopkins, to pension.
17576	„ J. R. Ireson..	26.8.09	General Duty	„ A. C. Andrews, promoted.
17748	„ C. H. Dissent	1.9.09	Nursing ..	„ F. Bird, promoted.
12589	Corporal A. Harris ..	7.9.09	„ ..	„ V. E. Jewell, to Territorial Forces.
13025	„ F. C. Bovey..	7.9.09	Q.A.I.M.N.S.	„ J. W. Elliott, promoted.
13661	Lce.-Serjt. P. J. Le Page	8.9.09	Nursing ..	„ H. Secker, promoted.
12261	Corporal J. E. Green	13.9.09	„ ..	„ G. Piercy, to pension.
11690	Lce.-Serjt. S. Sankey ..	24.9.09	General Duty	„ F. E. C. Godwin, to pension.
15027	„ W. Bush ..	25.9.09	„ ..	„ G. P. Jones, promoted.
18216	Corporal R. G. Leggett	1.10.09	„ ..	„ J. F. Hampton, promoted.



*To be Corporals.*

To complete establishment, 1.10.09: 15289 Lance-Corporal H. R. M. Rodman, 16982 Lance-Corporal J. Medland, 17012 Lance-Corporal E. Byrne, 16997 Lance-Corporal W. H. Youlton, General Duty; 16996 Lance-Corporal J. C. McBryer, 17060 Lance-Corporal S. Reeves, Cooking; 17108 Lance-Corporal H. Munro, Clerical; 17128 Lance-Corporal F. G. Fuller, Nursing; 17165 Lance-Corporal F. T. Holloway, General Duty; 17520 Lance-Corporal C. Good, 17541 Lance-Corporal P. McConn, 17555 Lance-Corporal M. Kinder, 17573 Lance-Corporal C. Harlen, 17584 Lance-Corporal W. Preston, 17598 Lance-Corporal W. Sparks, 17663 Lance-Corporal G. Duerden, 17721 Lance-Corporal R. Fetherston, Nursing; 11015 Lance-Corporal W. E. Phillips, 11040 Lance-Corporal J. Stroud, General Duty; 11492 Lance-Corporal H. W. Stoner, Nursing; 295 Lance-Corporal A. E. Cheer, 12071 Lance-Corporal C. Everett, General Duty; 12418 Lance-Corporal E. J. Russell, Nursing; 14671 Lance-Corporal E. W. Brunton, Cooking; 16432 Lance-Corporal J. A. White, Q.A.I.M.N.S.

**APPOINTMENTS.**

The following appointments, to complete Establishment, will take effect from the dates specified:—

*To be Lance-Serjeants. (As Dispensers.)*

To complete establishment, 1.10.09: 17785 Corporal G. L. Shore, 18253 Corporal J. Suter, General Duty; 18976 Corporal E. G. Robinson, Q.A.I.M.N.S.; 18337 Corporal C. Leaker, Nursing; 18385 Corporal F. W. Coupland, General Duty; 18432 Corporal G. F. Pearce, Clerical; 18445 Corporal J. E. Crawley, General Duty; 18194 Corporal W. F. Avery, Cooking; 18684 Corporal F. H. Galton, 18645 Corporal C. E. Rouse, Nursing; 18850 Corporal G. W. Eagles, General Duty.

*To be Lance-Corporals.*

Special under para. 281, S.O., 16.7.09: 19933 Private W. C. Savegar, Nursing.  
To complete establishment, 1.10.09: 8509 Private S. F. Young, Superintending Cook; 11864 Private S. W. Brooks, Nursing; 11895 Private J. Higgins, Superintending Cook; 15655 Private G. J. Caborn, 994 Private G. A. Davies, General Duty; 16949 Private G. Ireland, Superintending Cook; 17001 Private D. Blair, General Duty; 17819 Private A. T. Hort, Cooking; 17421 Private P. Plume, 17517 Private F. White, Nursing; 17557 Private J. F. Starie, Superintending Cook; 17628 Private T. Luscombe, 1st Class Clerk; 17888 Private M. Scott, Cooking; 17942 Private J. W. Taylor, 17974 Private F. V. Moon, General Duty; 18029 Private A. L. Burr, Cooking; 18015 Private W. H. Dixon, Nursing; 18019 Private J. G. Julian, 1st Class Clerk; 18043 Private R. Eagar, General Duty; 18033 Private J. Gleave, Superintending Cook; 18093 Private G. Ryan, General Duty; 19895 Private W. Smith, Nursing; 18090 Private A. C. Wilson, Superintending Cook; 19966 Private G. V. Chatten, General Duty; 18126 Private T. P. Walshe, 1st Class Clerk; 18157 Private A. Pruden, Nursing; 18153 Private E. E. Beadle, 1st Clerk Clerk; 18185 Private W. C. H. Mayo, Nursing.

**CASUALTIES.**

*Discharges.*—5901 Serjeant-Major C. E. Phillips, October 28, 1909, to pension; 8051 Quartermaster-Serjeant J. H. Curtayne, October 31, 1909, after three months' notice; 8208 Quartermaster-Serjeant G. J. Lander, November 9, 1909, termination of second period; 8197 Staff-Serjeant J. M. Mason, November 4, 1909, termination of second period; 7213 Serjeant J. M. Webb, October 22, 1909, after three months' notice; 9324 Serjeant A. W. Buckley, October 25, 1909, medically unfit; 8198 Corporal H. J. Farr, November 6, 1909, termination of second period; 7134 Corporal A. E. Bowyer, November 15, 1909, after three months' notice; 8169 Corporal W. H. Allen, October 15, 1909, termination of second period; 11579 Private F. Tribe, October 18, 1909, termination of first period; 8183 Lance-Corporal W. Rogers, October 26, 1909, termination of second period; 18207 Private F. C. Cousins, November 1, 1909, medically unfit; 2005 Private F. F. Parratt, November 4, 1909, medically unfit; 18513 Private A. Holland, November 5, 1909, on payment of £25; 4467 Private F. Watts, November 3, 1909, on payment of £10;

985 Private C. E. Brown, November 13, 1909, medically unfit; 2231 Private L. E. Parr, November 9, 1909, on payment of £18; 4527 Private W. Lang, November 6, 1909, on payment of £10.

*Transfers to Army Reserve.*—818 Private E. Allen, October 9, 1909; 836 Private A. Ashwin, October 14, 1909; 820 Private C. F. Harvey, October 10, 1909; 822 Private H. Robinson, October 11, 1909; 16326 Private D. Phenix, October 11, 1909; 17657 Private E. G. Inns, October 13, 1909; 819 Private G. Pickering, October 10, 1909; 824 Private A. J. Bilham, October 11, 1909; 16348 Private A. E. Chasty, October 15, 1909; 16324 Private A. Cooper, October 11, 1909; 16178 Corporal T. J. Macaulay, September 1, 1909; 16349 Private G. Christie, October 16, 1909; 16352 Private A. B. Court, October 18, 1909; 845 Private W. R. Hoskin, October 16, 1909; 858 Private A. L. Baker, October 18, 1909; 857 Private F. A. Sargent, October 17, 1909; 16342 Private J. Fieldin, October 17, 1909; 16354 Private J. L. Cook, October 20, 1909; 16344 H. A. Scarratt, October 20, 1909; 868 Private H. T. Cobie, October 22, 1909; 871 Private F. Wilford, October 22, 1909; 16377 Private L. Stark, October 20, 1909; 856 Private A. G. Lipscombe, October 18, 1909; 869 Private J. F. Swanton, October 22, 1909; 16355 Private G. McDonald, October 20, 1909; 16353 Private J. Carr, October 20, 1909; 16374 Private E. H. Barney, October 21, 1909; 881 Private H. David, October 23, 1909; 910 Private B. Harris, October 30, 1909; 884 Private J. Crutch, October 24, 1909; 16444 Lance-Corporal G. Stubbington, October 27, 1909; 887 Private T. T. Marston, October 25, 1909; 16449 Colonel J. Sutherland, October 30, 1909; 888 Private W. G. Cooper, October 25, 1909; 16432 Corporal J. A. White, October 28, 1909; 16428 Private J. Down, October 28, 1909; 36 Private T. J. Busby, October 29, 1909; 16427 Private G. Brennan, October 28, 1909; 905 Private H. Allen, October 29, 1909; 16434 Private G. R. Taylor, October 29, 1909; 916 Private D. Enon, October 31, 1909; 909 Private F. G. Lockyer, October 30, 1909; 928 Private W. Morris, November 2, 1909; 16475 Private J. Jeffray, November 3, 1909; 16438 Private H. Minchin, November 1, 1909; 917 Private A. H. Davis, October 31, 1909; 914 Private C. W. Jones, October 31, 1909; 930 Private W. G. Llewellyn, November 4, 1909; 923 Private J. Lewis, October 31, 1909; 920 Private W. Bartlett, November 1, 1909; 936 Private F. J. Constable, November 5, 1909; 933 Private G. H. Slape, November 4, 1909; 16478 Private C. B. Boniface, November 5, 1909; 16486 Private E. A. Leeper, November 6, 1909.

*Transfers to other Corps.*—1062 Private W. J. Harman, October 20, 1909, to King's Royal Rifles; 1902 Private M. B. Reay, October 27, 1909, to 21st Lancers.

*Transfers from other Corps.*—4481 Private J. Benson, October 20, 1909, from Royal Irish Fusiliers; 4482 Private B. J. Hook, October 20, 1909, from Welsh Regiment; 4521 Private A. G. Clark, September 21, 1909, from Loyal North Lancashire Regiment; 4582 Private R. J. Ward, November 4, 1909, Army Service Corps; 4583 Private G. Tracy, November 8, 1909, from Army Service Corps; 4593 Private P. Martin, October 15, 1909, from 4th Battalion Rifle Brigade.

*Deaths.*—12725 Private M. Hayes, October 30, 1909.

*EMBARKATIONS FOR ABROAD.*—To Ceylon.—11789 Corporal W. Skinner, October 15, 1909.

To South Africa, per ss. "Braemar Castle," October 19, 1909.—12987 Lance-Serjeant B. Walter, 17102 Corporal D. Harvey, 17257 Lance-Corporal J. Bartlett, 17084 Lance-Corporal J. Hunter, 846 Private G. D. Dean, 1082 Private J. McKeague, 153 Private G. T. Richardson, 811 Private E. Freeland, 510 Private W. Brewer, 273 Private J. McSorley, 16434 Private G. V. Brewer, 19121 Private J. Cook, 139 Private F. H. Simons, 167 Private A. J. Hutchison, 182 Private R. Pool, 223 Private W. Peake, 828 Private F. Livingstone, 659 Private L. T. Rousell, 418 Private B. Horsfall, 754 Private H. Russell, 206 Private W. Pardy.

To Mauritius, per ss. "Braemar Castle," October 19, 1909.—18718 Serjeant W. H. Parr, 17465 Lance-Corporal J. Bell, 17494 Private F. Peckham, 266 Private W. E. George, 764 Private R. Boddy, 809 Private T. Rowland, 1096 Private J. A. Corney, 1842 Private J. Coffy.

*DISSEMBARKATIONS FROM ABROAD.*—From Malta, per P. and O. ss. "Persia," October 16, 1909.—10929 Quartermaster-Serjeant E. H. Rossiter, 10024 Serjeant G. Lampard, 11029 Serjeant A. Spowage, 10124 Corporal T. Bateman, 12275 Corporal P. M. Quereé.

From Sierra Leone, per ss. "Burutu," October 29, 1909.—18158 Corporal G. P. Pursey.

From Sierra Leone, per ss. "Olenda," November 8, 1909, 18985 Serjeant S. Shaw.

THE FOLLOWING N.C.O's AND MEN HAVE QUALIFIED FOR PROMOTION IN THE VARIOUS CORPS EXAMINATIONS.

*For Staff-Serjeant.*—10084 Serjeant F. A. Mulley, 11613 Serjeant G. R. Morris, 11370 Serjeant F. Loveland, 15001 Serjeant W. Hurst.

*For Serjeant.*—17500 Corporal R. R. White.

*For Corporal.*—18689 Private C. Appleton, 18128 Private J. T. Marr, 943 Private A. H. Ball, 19730 Private W. T. Young, 19536 Private E. Reece.

*As Dispensers.*—18239 Corporal R. F. Roland, 18018 Corporal F. G. Phipps, 19763 Private A. J. Luxon, 15725 Corporal T. Eastwood, 590 Private F. C. Gilbert, 16564 Corporal C. Vickers, 18855 Private J. Ellison, 16996 Corporal J. C. McBryer, 12275 Corporal P. M. Querée, 19652 Private C. V. Jefford, 9121 Corporal S. Barter, 12779 Corporal G. Stubbs, 11788 Corporal D. Macdonald, 12461 Corporal P. F. Cook, 8990 Corporal H. H. Field, 9559 Corporal W. Greaves, 14924 Corporal J. G. A. Forbes, 17928 Corporal W. S. Toye, 16449 Corporal J. Sutherland, 19950 Private H. J. Loder, 1836 Private C. Dovey, 103 Private G. P. Steer, 19792 Private H. A. Baigent, 19543 Private F. E. H. Audus.

**Award of Army Form C 344.**—The following Non-Commissioned Officers and Orderlies were successful at the recent examination for Army Form C 344, "Certificate of Training as Nurse," held in May, 1909. (Stations Abroad.)

No	Rank and Name	Station	Percentage of Marks	Order of merit as regards number of marks awarded
19272	Private J. W. Lee .. ..	Egypt .. ..	0.79	1
87	" A. W. Woodley .. ..	South Africa .. ..	0.76	2
17421	" P. Plume .. ..	Malta .. ..	0.75	3
19102	" H. C. Hughes .. ..	" .. ..	0.74	4
45	" T. J. Moffatt .. ..	Gibraltar .. ..	0.74	5
15848	Corporal A. E. Garbett-Burbidge	South Africa .. ..	0.74	
211	Private G. F. Goulding .. ..	Malta .. ..	0.74	6
18015	" W. H. Dixon .. ..	" .. ..	0.73	
19621	" W. E. Kite .. ..	" .. ..	0.72	7
19198	" F. T. Harper .. ..	South Africa .. ..	0.72	
12474	" W. Soper .. ..	" .. ..	0.72	8
113	" J. D. Powell .. ..	Malta .. ..	0.72	
19161	" G. Parkinson .. ..	South Africa .. ..	0.72	9
19752	" H. Mayes .. ..	" .. ..	0.71	10
19652	" C. V. Jefford .. ..	Gibraltar .. ..	0.71	11
272	" R. M. Pout .. ..	South Africa .. ..	0.70	12
218	" L. A. Dale .. ..	Gibraltar .. ..	0.70	13
19103	" H. G. Noble .. ..	Malta .. ..	0.69	14
14956	" E. J. Stangroom .. ..	" .. ..	0.69	
184	" I. B. Dodd .. ..	" .. ..	0.69	15
918	" W. Nelson .. ..	South Africa .. ..	0.69	
795	" H. H. Hunt .. ..	Egypt .. ..	0.68	16
501	" O. Benson .. ..	" .. ..	0.63	17
19971	" E. J. Biggins .. ..	South Africa .. ..	0.60	18

**Nursing Section.**—The following appointments to the Nursing Section of the Corps will take effect from the dates specified:—

No.	Rank and Name	Date	No.	Rank and Name	Date
1750	Pte. P. Barron ..	8.7.09	2019	Pte. S. J. Williamson	26.8.09
2146	„ E. A. Smith ..		1578	„ E. Savage ..	14.8.09
19135	„ W. H. Quelch ..	12.7.09	18656	„ H. G. Maywood..	16.8.09
1767	„ G. H. Hender ..		17517	„ †F. White ..	17.8.09
2023	„ D. Riordan ..	28.7.09	19607	„ R. C. Pottow ..	18.8.09
2064	„ W. Walsh ..		1650	„ W. B. Ridewood	
2028	„ J. Howard ..	30.7.09	1894	„ H. G. Benjafield	
1390	„ T. Hackett ..	3.8.09	1929	„ E. Robbins ..	
1414	„ T. Ball ..	9.8.09	2071	„ R. H. Coote ..	26.8.09
1988	„ H. Rhodes ..		2074	„ C. Bowen ..	
226	„ A. H. Wilks ..	14.8.09	2084	„ F. S. Titchener..	
2060	„ E. Hoult ..	19.8.09	2188	„ A. Smithies ..	
19851	„ *P. E. Claydon ..	20.8.09	1987	„ J. C. Herbert ..	10.9.09
18807	„ J. Kendall ..	23.8.09	2009	„ H. Latimer ..	
19894	„ C. A. Cook ..		590	„ F. C. Gilbert ..	11.9.09
1731	„ C. Northcott ..	26.8.09	1768	„ R. R. Sturrock ..	24.9.09
1885	„ E. D. Marshall ..		1974	„ C. D. Ferguson ..	
1887	„ C. Wood ..		1663	„ H. E. Furniss ..	28.9.09
1909	„ J. J. Fowell ..		2135	„ W. Kellow ..	
1993	„ E. G. Passingham		2226	„ F. J. Chatting ..	
2013	„ W. J. Connell ..				

\* Appendix 2, III. (2), Standing Orders.

† Reappointed.

**Advancement of Privates (Corps Pay).**—The following advancements in rate of Corps Pay will take effect from October 1, 1909:—

*To be Advanced to the Third Rate (at 8d.).*

*As Orderlies.*

No.	Name	No.	Name	No.	Name
15803	Stuart, H. B.	19710	King, H. S.	118	Rogers, A. C.
17698	Betterton, A.	19732	Mayes, H.	511	Beauchamp, F.
17826	Malone, T.	19758	Manners, W.	754	Russell, H.
17907	Hobson, J. E.	19806	Deans, W.	988	Pretty, G.
18312	Howitt, J.	19814	Crocker, A. G.	1070	Harwood, G. H.
18452	Stammers, G. H.	19914	Virgin, A. F.	1072	French, H. A.
19406	Moore, F.	37	Lovett, W. R.	1112	Sheehan, J.
19449	Charles, W.	94	Price, D. W.		

*As Clerks.*

19037 | Thomas, W. B. || 17 | Berry, A. C. || 266 | George, W. E.

*To be Advanced to the Fourth Rate (at 6d.).  
As Orderlies.*

No.	Name	No.	Name	No.	Name
18207	Cousins, F. C.	1580	Gray, A.	1348	Abbess, S. G.
18284	Martin, F.	1581	Horn, W. R.	1369	Earle, B. L.
18378	Manley, E.	1611	Hodson, P.	1379	Hughes, W.
18518	Darlington, J. W.	1698	Joseph, I.	1388	Rouse, J.
18544	Branchett, E. T.	1716	Duncombe, F. G. H.	1612	Boyd, W.
19171	Smith, W. A.	1782	Topp, S. J.	1644	Flavell, C. W.
19502	Boulter, F. G.	1785	Phillips, W. J.	1661	Fielding, H. E.
844	Johnstone, B. D.	1789	Postons, F. A.	1679	Gray, A.
961	Smith, R. E.	1790	Wilkes, F. W.	1688	Drew, G. H. F.
972	Cox, S.	1808	McClay, W. J.	1690	Hargreaves, G.
977	Hill, W.	19802	Leakey, A.	1892	Judd, H.
1039	Hall, A. F.	19842	Cox, W. H.	1841	Fielding, S. E.
1051	Davis, W. M.	19916	Carroll, H. J.	1848	Martins, A. V.
1061	McSweeney, J. F.	237	Flavell, J. E.	1975	Hawkes, W.
1393	Vear, A.	304	Haskins, W. I.	2115	Taylor, A. C.
1394	Clarke, F. H.	828	Livingstone, T.	42	Harding, D. G.
1440	Johnston, G.	1120	McLachlan, H.		
1502	Bennison, F.	1141	Dyson, H. A.		

*As Clerks.*

18829 | Chesterman, F. E. || 1643 | Mattock, F. H. || 1875 | Kitchen, J. E.

*As Cooks.*

18637 | Coulter, E. || 18893 | Crook, R. || 1788 | Hazell, J.

The advancement to the Fourth Rate of Corps Pay at 6d., as an Orderly, of No. 1097 Private R. Herbert, is hereby cancelled.

**Sanitary Orderlies (Corps Pay).**—The following Privates are advanced to the Fourth Rate of Corps Pay at 6d., as Sanitary Orderlies, from the dates specified :—

No.	Name	Date	No.	Name	Date
19880	Parkings, A. L.	1.10.08	944	Westlake, H. J.	1.8.09
19880	Parkings, A. L.	1.6.09	1024	Newman, H. W.	5.8.09
19908	Norman, E.	7.6.09	17820	Peckham, H.	17.8.09
1268	Gray, J.	30.6.09	920	Bartlett, W.	24.8.09
19055	Reed, W. R.	26.7.09	1877	Curry, R. C.	26.8.09
1935	Harple, F.	27.7.09			

**Buglers.**—The following Boys are appointed Buglers from the date specified :—

No.	Name	Date	No.	Name	Date
2040	Freeston, J. H.	26.7.09	2257	Lever, T. J.	14.9.09
2253	Newland, E. W.	14.9.09			

**Amendments (Corps Orders).**—With reference to Corps Order, dated July 1, 1909, in the column for "Section," opposite the names of No. 18453 Lance-Serjeant F. A. Philbrook, and No. 17748 Lance-Serjeant C. H. Dissent, for "General Duty Section" read "Nursing Section."

**NOTES FROM TIDWORTH.**—Major C. M. Fleury writes: "It is some time since my last notes were written, and much has happened since then. Quite a gloom was cast over the Station by the death of Staff Nurse C. A. Coats, Q.A.I.M.N.S., on November 2. She had been ill for a short time only, and her death after an abdominal

operation came as a great shock to us all. On November 4 a service was held in the Presbyterian Church, the Rev. Jaffray, Chaplain to the Forces, officiating. It was a most impressive one. The band of the Royal Scots Greys very kindly played at it. There was a large congregation, among others present being Brigadier-General Drummond, commanding at Tidworth; Colonel Ford, Administrative Medical Officer, Tidworth District; Miss Keer, R.R.C., Matron-in-Chief, Queen Alexandra's Imperial Military Nursing Service; Lieutenant-Colonel Lane and officers representing all regiments and departments in Tidworth; Miss Cox, the Matron, and all the Sisters of the Queen Alexandra's Imperial Medical Nursing Service were also present as well as some from Millbank. From the church the coffin was borne on a gun carriage to the railway station, the interment taking place at Aberdeen.

"The band of the Devonshire Regiment and Lancashire Fusiliers attended, and the firing party was furnished by the Lancashire Fusiliers. All the officers and every available man of 20th Company, Royal Army Medical Corps, attended, the officers of 20th Company being pall bearers. The coffin was covered with wreaths received from all parts of the country, including one sent by the patients whom she had been tending but a few days before in Hospital.

"Quite a number of changes have taken place. Captain Tyndale, C.M.G., has gone to 'the College.' Captain Baillie is under orders to embark for service on the West Coast of Africa at an early date. Captain Carr has joined here for duty; also Lieutenant Byatt. Serjeant-Major E. V. Saunders has obtained his commission as Quartermaster, and has left us for Netley. Serjeant-Major Senior has stepped into the appointment vacated by Serjeant-Major Saunders. Another Serjeant-Major has, therefore, been posted to the Company, and an old Malta friend has turned up in Serjeant-Major Lowe.

"Well, the Manœuvres are over. I anticipated in some former notes that we were looking forward to a pleasant time, and I certainly think we got it. Life has, indeed, been very strenuous, what with the Royal Army Medical Corps Camp of Instruction, Divisional Training, and Manœuvres. I asked one man of the Company whether he had had a good time, and his reply was, 'Yes, Sir, I've had the time all right, but I can't class it as good.' It was certainly very wet, and there was a deal of hard work, but no one grumbled. I rather gather the officer commanding the Field Ambulance had 'the time of his life,' but that is another story. I think those of us who were at Wootton Bassett will not think unkindly of the Manœuvres.

"In some future notes I will deal with the prospects of the football season. A great many changes have taken place in the *personnel* of the Company, and it is a little difficult to say what sort of a team we shall have.

"Someone has written and asked if there is any boating here. We have a river described in the Ordnance Maps as the 'River Bourne. Sometimes dry.' It certainly has not suffered much from this complaint during the past summer."

**NOTES FROM MALTA.**—Captain Gibbon writes (under date November 11): "Since writing last, we have had to congratulate Major G. S. Crawford, Captains H. S. Anderson, H. C. Winckworth, P. A. Lloyd-Jones and Surgeon-Captain R. Randon, Royal Malta Artillery, on receiving decorations from the King of Italy in recognition of their services with the Field Ambulance at Catona after the earthquake in Sicily and Calabria last January, Major Crawford to be Commander of the Crown of Italy, the others to be Chevaliers of the same Order. These were presented by His Excellency the Governor and Commander-in-Chief, at Valletta Palace, on October 29.

"On the 15th, the first of our monthly meetings was held in the library at Valletta Hospital, Colonel J. G. MacNeece in the chair, when Major French read a very interesting paper 'On Treatment in Venereal Cases,' especially with regard to after-treatment of gonorrhœa, with a view to shortening the stay of these patients in hospital.

"At the same meeting a case of enlarged spleen in a child was shown by Captain Weld with special reference to kala-azar in such cases, as described by Nicolle in Tunis. This is the second case seen here lately, Captain Babington drawing attention to the first case several months ago, but in neither case so far have the Leishman-Donovan bodies been demonstrated. Lieutenant-Colonel Birt drew attention to the possibility of infection by dogs, described by the same authority in Tunis, but the family dog in the latter case has so far failed to produce any bodies from his liver. Neither of these cases have occurred in military families, and in consequence, it is very difficult to keep them under observation.

"This is the slack season with regard to sport, as the football league does not begin

until November. Up to this we have only played two friendly matches, one against the Devon Regiment, which ended in a draw, and the other against H.M.S. 'Egmont,' which we won."

**NOTES FROM CAIRO.**—Captain R. C. Hallows writes (under date November 7): "The Royal Army Medical Corps Officers' Mess in Egypt during the month of September has had its existence more or less secured. It first saw light a little over two years ago, and despite all sorts of alarming rumours to the effect that we were to be turned out of the quarters, which had been acquired and equipped with much thought and trouble, the unpleasant forebodings of having to look for a resting-place elsewhere have gone to the four winds of heaven.

"We are now allowed certain rooms at The Citadel, which up to last month were furnished with Government furniture to which, apparently, we were not entitled; so to get over the difficulty we have purchased it at a reasonable price, but consequently the mess cannot be called an authorised and official one.

"During all the period of uncertainty great care was taken to avoid unnecessary expenditure while, at the same time, ensuring the comfort of its members, but now that the cloud of doubt is blown away everything needful will be secured to satisfy the most capricious.

"Those working at The Citadel know the utility, comfort, and convenience of this mess, and it is to be hoped that all those who find themselves ordered to the Military Hospital for duty will appreciate the work of those who pioneered the venture as they reap its benefits.

"On Thursday, September 23, the officers gave a farewell dinner in the mess to Major P. Evans and C. K. Morgan. The N.C.O.'s and men of No. 33 Company, Royal Army Medical Corps, gave in the Chaplain's Recreation Room in The Citadel, which was suitably decorated with flags, a farewell smoking concert in honour of Serjeant-Major Fry and sixteen N.C.O.'s and men Royal Army Medical Corps leaving for home, tour expired.

"After dinner all the officers went as guests to the concert which was then in full swing; the room was very full and 'Lady Nicotine' shrouded all in her filmy wreaths.

"When the interval arrived, after the King's Toast had been honoured, Quartermaster-Serjeant Bennett, as Master of Ceremonies, called for silence, and Lieutenant-Colonel W. J. Baker, R.A.M.C., in well-chosen words made a presentation on behalf of the Royal Army Medical Corps officers in Egypt, consisting of a canteen suitably engraved, to Serjeant-Major Fry, who, to the regret of all, was not only leaving the Command but whom the Service will be losing shortly owing to retirement.

"Quartermaster-Serjeant Bennett then made the presentation on behalf of the N.C.O.'s and men, No. 33 Company, Royal Army Medical Corps, stationed at Cairo, a gold chain and handsome pipe.

"All stood and drank to Serjeant-Major Fry's health, prosperity and luck, winding up with the time honoured 'For he's a jolly good fellow.' When order had been restored Serjeant-Major Fry feelingly thanked all for their extreme kindness, courtesy, and help which had made the performance of his duties a light matter and always a pleasure; he considered his years spent in Egypt amongst the happiest of his life.

"Several other toasts were drunk and speeches made before the concert came to an end at midnight.

"I append the programme, which was an excellent one:—

#### PART I.

- |                                |  |                      |
|--------------------------------|--|----------------------|
| 1. <i>Pianoforte Selection</i> | .. .. .  | Boy LAX.             |
| 2. <i>Song</i> .. .. .         | .. .. . 'Sammy'  | Pte. BERRY.          |
| 3. <i>Song</i> .. .. .         | .. .. . 'Where the White Nile meets the Blue'          | Pte. J. J. YOUNG.    |
| 4. <i>Song</i> .. .. .         | .. .. . Selected                                       | Serjt. THORNEYCROFT. |
| 5. <i>Song</i> .. .. .         | .. .. . 'Cabby'  | Pte. COGGAN.         |
| 6. <i>Song</i> .. .. .         | .. .. . Selected                                       | Serjt.-Major BARKER. |
| 7. <i>Song</i> .. .. .         | .. .. . Selected                                       | Serjt. CLENSHAW.     |
| 8. <i>Song</i> .. .. .         | .. .. . 'Jockular Jock'                                | Pte. KNIGHT.         |
| 9. <i>Song</i> .. .. .         | .. .. . 'When the Sunset turns the Ocean Blue to Gold' | Pte. EMMETT.         |
| 10. <i>Cornet Solo</i> .. .. . | .. .. .  | Pte. ADAMS, K.O.S.B. |
| 11. <i>Song</i> .. .. .        | .. .. . 'Swanee River' (Parody)                        | Pte. PERKINS.        |
| 12. <i>Song</i> .. .. .        | .. .. . 'Powder Monkey'                                | Serjt.-Major E. FRY. |
| 13. <i>Song</i> .. .. .        | .. .. . 'The Old Irish Gentleman'                      | Capt. O'GRADY.       |

14. Song..	..	..	..	'In the Twi-twi-light'	..	..	..	Pte. BULL.
15. Song..	..	..	..	'Into thy Hands'	..	..	..	Pte. H. H. HUNT.
16. Song..	..	..	..	'A Warrior Bold'	..	..	..	Pte. MIRAMS.

## PART II.

1. Song..	..	..	..	'You've got a long way to go'	..	..	..	Pte. BERRY.
2. Concertina Selection	..	..	..	..	..	..	..	Pte. COGGAN.
3. Song..	..	..	..	'The Veteran's Song'	..	..	..	Mr. ESSEN.
4. Song..	..	..	..	Selected	..	..	..	Pte. BULL.
5. Song..	..	..	..	Selected	..	..	..	Serjt.-Major BARKER.
6. Song..	..	..	..	Selected	..	..	..	Staff-Serjt. THORNEYCROFT.
7. Song..	..	..	..	'I wouldn't grumble any more'	..	..	..	Pte. J. J. YOUNG.
8. Song..	..	..	..	Selected	..	..	..	Serjt. CLENSHAW.
9. Song..	..	..	..	'Put me among the Girls'	..	..	..	Pte. EMMENT.
10. Song..	..	..	..	'Queen of the Earth'	..	..	..	Pte. MIRAMS.
11. Song..	..	..	..	'Who can resist the darlings?'	..	..	..	Serjt.-Major E. FRAY.
12. Song..	..	..	..	'Gallant Deeds'	..	..	..	Pte. KNIGHT.
13. Violin Solo..	..	..	..	..	..	..	..	Pte. LAX, K.O.S.B.
14. Song..	..	..	..	Selected	..	..	..	Pte. PERKINS.

'God save the King.'

"We are looking forward to the return of Colonel J. M. Jones, P.M.O., in Egypt, who arrives the middle of this month from England, where he was obliged to go early in March on account of ill-health; Lieutenant-Colonel W. J. Baker, R.A.M.C., acted for him during his absence.

"The following is the rearrangement of Royal Army Medical Corps Officers in Egypt: Major J. V. Forrest and Lieutenant W. R. O'Farrell arrived at Alexandria by the H.T. 'Braemar Castle,' from Southampton and proceeded to the Military Hospital, Cairo, for duty, while the following day Lieutenant-Colonel J. F. Donegan and Majors P. Evans and C. K. Morgan embarked on the same troopship on their homeward voyage, tour expired.

"Lieutenant-Colonel H. T. Knaggs has taken over the Military Hospital and Detachment Royal Army Medical Corps at Alexandria, *vice* Lieutenant-Colonel J. F. Donegan.

"Major J. C. Jameson proceeds to Khartoum about the middle of the month to assume charge of the Military Hospital there *vice* Major W. Erskine, proceeding home in December.

"Major T. V. Forrest takes over the appointment of Company Officer at the Military Hospital, Cairo, from Major J. C. Jameson.

"Captains S. de C. O'Grady and R. Collis Hallows have been transferred from the Military Hospital, Cairo, to Abbassiyeh and Kasr-el-Nil respectively in medical charge of the non-dieted hospitals and troops there, *vice* Lieutenant-Colonel H. T. Knaggs and Major C. K. Morgan.

"Captains G. A. D. Harvey, and G. H. Rees, at present in England on leave from the Military Hospitals at Cairo and Khartoum respectively, on their return change about.

"Captain E. E. Ellery, who has been appointed Surgical Specialist in place of Major P. Evans, was expected by the 'Braemar Castle' last month, but unfortunately an accident has necessitated his admission to the Military Hospital at Millbank; we wish him a speedy recovery and hope to see him soon out amongst us to help in our arduous winter's work which is about to commence.

"Lieutenant A. E. G. Fraser is at present on leave in England from the Military Hospital, Cairo."

**NOTES FROM WYNBERG.**—Serjeant-Major C. W. Kinsella, R.A.M.C., writes: "The Wynberg Officers, Non-Commissioned Officers and men of No. 22 Company, Royal Army Medical Corps, were 'At Home' in the Wynberg Town Hall on October 15, some 300 guests being present. Music, dancing and bridge adequately filled the bill, the string band of the 1st King's Own Yorkshire Light Infantry providing a pleasing programme of some twenty dances. Songs were rendered by Miss Miriam Merritt, Messrs. Alberto and Baker, and Corporal Leggatt. The hall was tastefully decorated, and a buffet for light refreshments was run throughout the evening by Mr. Boffey, of the Royal Hotel, Wynberg, a pleasant entertainment concluding about 2.30 a.m. Amongst those present were Colonel G. W. Robinson, A.M.D., Lieutenant-Colonel



Hickson, O.C., and Mrs. Hickson, Major and Mrs. Collins, Major, Mrs. and Miss Merritt, Captain Hanafin, Lieutenant and Mrs. Conolly, R.A.M.C., Lieutenant Bradshaw, A.S.C., Mrs. and Miss Bradshaw, and several local residents. Much credit is due to the hard working Committee.

"Major W. E. Hardy, Serjeant McCreeth and two men proceeded on manoeuvres with the King's Own Yorkshire Light Infantry from October 18 to 27, the last day's march being 35 miles.

"Our cricket team has joined the Wednesday League, and won their first match, against Maitland, by 47 runs.

"Miss Hutton-Potts, Matron; Miss Osborne, Sister; and Staff-serjeant Elliott embark on the H.T. 'Braemar Castle' on November 27, for passage home."

**NOTES FROM SIMLA.**—Lieutenant-Colonel R. S. F. Henderson, R.A.M.C., Secretary to Principal Medical Officer, His Majesty's Forces in India, writes under date October 21, 1909 :—

"*Appointments.*—Colonel E. Butt appointed Principal Medical Officer Presidency and Assam Brigades, with effect from September 15, 1909, vice Colonel J. G. Harwood, retired.

"The Royal Army Medical Corps officers shown in the attached list have been :—

"I.—Posted to the command of station hospitals.

"II.—Nominated for transfer to and from Burma during next cold weather.

"III.—Appointed trooping medical officers at Bombay and Karachi.

**"I.—TO COMMAND STATION HOSPITALS.**

"*Northern Army.*—Lieutenant-Colonel M. W. O'Keeffe, Rawal Pindi, February 10, 1908; Lieutenant-Colonel B. M. Skinner, M.V.O., Peshawar, May 1, 1909; Lieutenant-Colonel A. A. Sutton, D.S.O., Nowshera, on arrival from England; Lieutenant-Colonel H. J. Fletcher, Sialkot, May 1, 1909; Lieutenant-Colonel M. O. D. Braddell, Lahore Cantonment, February 10, 1909; Lieutenant-Colonel G. F. H. Marks, Ferozepore, on arrival from England; Lieutenant-Colonel H. Carr, Jullundur, on arrival from England; Lieutenant-Colonel A. E. Tate, Ambala, February 10, 1909; Lieutenant-Colonel E. H. Lynden-Bell, Meerut, to relieve Lieutenant-Colonel F. J. Jencken; Lieutenant-Colonel G. H. Barefoot, Bareilly, to relieve Lieutenant-Colonel T. B. Winter; Lieutenant-Colonel H. N. Thompson, D.S.O., Lucknow, March 10, 1909; Lieutenant-Colonel W. E. Berryman, Fyzabad, to relieve Lieutenant-Colonel H. A. Haines; Lieutenant-Colonel J. S. Davidson, Allahabad, on arrival from England; Lieutenant-Colonel W. B. Thomson, Calcutta, January 1, 1908; Lieutenant-Colonel H. H. Brown, Murree, to relieve Lieutenant-Colonel H. D. Rowan; Lieutenant-Colonel T. Daly, Dalhousie, to relieve Lieutenant-Colonel W. C. Beevor, C.M.G.; Major H. N. Dunn, Dagshai, to relieve Major T. W. Gibbard; Major R. F. E. Austin, Jutogh, on arrival from England; Major (Bt., Lieutenant-Colonel) O. R. A. Julian, C.M.G., Kasauli, September 24, 1908; Major A. W. Bewley, Landour, to relieve Major H. W. K. Reid; Lieutenant-Colonel L. T. M. Nash, Ranikhet, March 1, 1909; Lieutenant-Colonel T. B. Winter, Chakrata, to relieve Lieutenant-Colonel W. T. Swan; Lieutenant-Colonel J. M. F. Shine, Naini Tal, December 10, 1908; Major R. J. Copeland, Darjeeling, to relieve Lieutenant-Colonel W. W. Pike, D.S.O.; Captain H. G. Martin, Lebong, to relieve Major T. McCulloch.

"*Southern Army.*—Lieutenant-Colonel R. L. R. Macleod, Karachi, February 22, 1908; Lieutenant-Colonel S. Westcott, C.M.G., Mhow, March 7, 1907; Lieutenant-Colonel J. S. Green, Nasirabad, November 8, 1908; Lieutenant-Colonel R. J. Geddes, D.S.O., Jubbulpore, February 10, 1909; Lieutenant-Colonel H. E. Cree, Jhansi, on arrival from England; Lieutenant-Colonel J. Battersby, Poona, to relieve Lieutenant-Colonel H. S. McGill; Lieutenant-Colonel A. T. I. Lilly, Belgaum, on arrival from England; Lieutenant-Colonel G. F. Gubbin, Colaba, March 25, 1906; Lieutenant-Colonel D. Hennessy, Ahmednagar, March 1, 1909; Lieutenant-Colonel W. C. Beevor, C.M.G., Bangalore, to relieve Lieutenant-Colonel T. J. R. Lucas; Lieutenant-Colonel G. Cree, Madras, March 15, 1908; Lieutenant-Colonel H. S. McGill, Secunderabad, to relieve Lieutenant-Colonel E. Butt; Lieutenant-Colonel C. E. Nichol, D.S.O., Maymyo, on arrival from England; Lieutenant-Colonel S. Powell, Rangoon, to relieve Lieutenant-Colonel P. C. H. Gordon; Major M. P. Corkery, Mount Abu, to relieve Major A. Burnside; Captain J. D. G. McPherson, Pachmarhi, to relieve Lieutenant-Colonel J. R. Stuart; Lieutenant-Colonel J. Meek, Wellington, to relieve Lieutenant-Colonel H. Cooks.

**"II.—TO BE TRANSFERRED FROM BURMA (1909-10).**

"Captain J. P. Lynch, 7th (Meerut), Ranikhet, for duty during summer of 1910;  
Captain A. H. Bond, 8th (Lucknow), Naina Tal, for duty during summer of 1910.

**"FOR DUTY IN BURMA (1909-10).**

"Lieutenant-Colonel C. E. Nichol, D.S.O., England, Maymyo, to command Station Hospital; Lieutenant-Colonel S. Powell, 9th (Secunderabad), Rangoon, to command Station Hospital, in relief of Lieutenant-Colonel P. C. H. Gordon; Major T. McCulloch, 8th (Lucknow); Major J. D. Alexander, England; Major S. J. C. P. Perry, F.R.C.S.I., England; Captain H. C. R. Hime, England; Captain R. T. Brown, England; Captain J. B. Cautley, 8th (Lucknow); Captain C. E. W. S. Fawcett, 9th (Secunderabad); Captain C. F. White, 8th (Lucknow); Captain T. S. Blackwell, 9th (Secunderabad); Lieutenant H. P. Hart, England; Lieutenant A. E. B. Jones, England.

**"III.—FOR DUTY IN CONNECTION WITH EMBARKATION AND DISEMBARKATION OF TROOPS AND INVALIDS, DURING THE SEASON 1909-10.**

"Karachi, Captain W. P. Gwynn; Bombay, Major J. Girvin.

"Leave.—Following officer is granted extension of medical certificate leave *ex* India :—

"Major G. T. K. Maurice, from September 30, 1909, to March 29, 1910.

"Specialists.—The following officer is appointed Specialist in the subject named, with effect from October 11, 1909 :—

"(c) *Advanced Operative Surgery*.—Major M. P. C. Holt, D.S.O., 2nd (Lahore) Division.

"The following officers, on transfer from the 8th (Lucknow) Division, are appointed Specialists in the subjects named, with effect from the dates of their assuming duties.

"(b) *Dermatology*.—Lieutenant C. H. Denyer, 5th (Mhow) Division.

"(d) *Ophthalmology*.—Captain P. S. O'Reilly, 9th (Secunderabad) Division.

"Transfers.—The following transfers of Royal Army Medical Corps officers from one Division to another are sanctioned :—

"On the expiration of his leave, Lieutenant-Colonel G. H. Barefoot, from 8th (Lucknow) to 7th (Meerut) Division.

"Captain D. de C. O'Grady, from 1st (Peshawar) to 2nd (Rawal Pindi) Division.

"Captain R. J. Cahill, from 1st (Peshawar) to 9th (Secunderabad) Division.

"Captain L. V. Thurston, from 5th (Mhow) to 1st (Peshawar) Division.

"Captains P. S. O'Reilly and W. G. Maydon, from 8th (Lucknow) to 9th (Secunderabad) Division.

"Lieutenant C. H. Denyer, from 8th (Lucknow) to 5th (Mhow) Division."

**SPECIAL RESERVE OF OFFICERS.**

**ROYAL ARMY MEDICAL CORPS.**

*Supplementary List.*

Lieutenant R. Magill, M.B., is confirmed in that rank, dated October 19, 1909.

The undermentioned to be Lieutenants (on probation) :—

Edward Andrew Gregg, dated July 30, 1909; Arthur Henry Habgood, dated September 22, 1909.

The undermentioned Lieutenants to be Captains :—

Robert A. O'Donovan, dated September 24, 1909; Robert J. Stirling, dated October 1, 1909.

**TERRITORIAL FORCE.**

*Northern Command Telegraph Companies, Royal Engineers (Army Troops).*—Surgeon-Major Henry Waite, from the Unattached List for the Territorial Force, to be Surgeon-Major, dated October 4, 1909.

**ROYAL ARMY MEDICAL CORPS.**

*1st Highland Field Ambulance.*—Lieutenant Peter Howie, M.B., to be Captain, dated September 14, 1909.

*1st Home Counties Field Ambulance.*—Transport Officer and Honorary Lieutenant Bernard D. Hobson resigns his commission, dated September 6, 1909

*2nd East Lancashire Field Ambulance.*—Lieutenant Alexander Callam to be Captain, dated September 28, 1909.

*3rd Wessex Field Ambulance.*—Elliott Beverley Bird to be Lieutenant, dated August 23, 1909.

*2nd Scottish General Hospital.*—Captain John Dixon Comrie, from 3rd Lowland Field Ambulance, Royal Army Medical Corps, to be Major, dated July 22, 1909.

*Attached to Units other than Medical Units.*

Captain William Roxburgh, M.B., to be Major, dated January 18, 1909.

ROYAL ARMY MEDICAL CORPS.

*1st Home Counties Field Ambulance.*—Quartermaster and Honorary Lieutenant Harry Tom Sargeant Cory to be Transport Officer, with the honorary rank of Lieutenant, dated October 4, 1909.

Herbert Charles Okill to be Quartermaster, with the honorary rank of Lieutenant, dated October 4, 1909.

*3rd Lowland Field Ambulance.*—Lieutenant James H. H. Pirie to be Captain, dated October 1, 1909.

*1st South Midland Field Ambulance.*—Lieutenant Hans Frederick William Boeddicker, M.B., from the 2nd South Midland Field Ambulance, Royal Army Medical Corps, to be Lieutenant, dated September 29, 1909.

*1st Wessex Field Ambulance.*—Lieutenant Leonard R. Toss will to be Captain, dated September 24, 1902.

*1st North Midland Field Ambulance.*—Captain William J. Reid to be Major, dated April 19, 1909.

*London Mounted Brigade Field Ambulance.*—Captain William Peart Thomas, M.D., from the 2nd London (City of London) Field Ambulance, Royal Army Medical Corps, to be Captain, dated September 27, 1909.

*1st Welsh Field Ambulance.*—Quartermaster and Honorary Lieutenant Thomas Dougall resigns his commission, dated October 9, 1909.

*1st London (City of London) General Hospital.*—Brigade Surgeon-Lieutenant-Colonel and Brevet-Colonel Charles Edward Harrison, C.V.O., M.B., F.R.C.S., retired pay (late Grenadier Guards), to be Lieutenant-Colonel, dated October 19, 1909.

*Attached to Units other than Medical Units.*

Lieutenant Ashley Bird to be Captain, dated April 1, 1908.

*For attachment to Units other than Medical Units.*

John Walter Pridmore to be Lieutenant, dated September 21, 1909.

UNATTACHED LIST FOR THE TERRITORIAL FORCE.

Harold Esmond Arnison Baldero to be Lieutenant, for service with the medical unit of the Oxford University Contingent, Senior Division, Officers' Training Corps, dated October 20, 1909.

ROYAL FIELD ARTILLERY.

*2nd Highland Brigade.*—Surgeon-Lieutenant Lloyd Turton Price, M.B., from the 1st Forfarshire Royal Garrison Artillery (Volunteers), to be Surgeon-Lieutenant, with precedence as in the Volunteer Force, dated April 1, 1908.

ROYAL ARMY MEDICAL CORPS.

*South Wales Mounted Brigade Field Ambulance.*—Captain John Griffiths, from the List of Officers attached to Units other than Medical Units, to be Captain, dated August 10, 1909.

*3rd Highland Field Ambulance.*—Lieutenant Sidney W. Smith, M.B., resigns his commission, dated June 15, 1909.

Henry James Gorrie to be Lieutenant, dated September 10, 1909.

*2nd West Lancashire Field Ambulance.*—George Charles Edward Simpson to be Lieutenant, dated October 4, 1909.

*2nd Lowland Field Ambulance.*—Lieutenant James A. H. Aitken, M.B., to be Captain, dated October 28, 1909.

*2nd North Midland Field Ambulance.*—Captain Montague S. W. Gunning resigns his commission, dated September 1, 1909.

*2nd Welsh Field Ambulance.*—Owen Lewellin Rhys, M.B., to be Lieutenant, dated September 25, 1909.

*1st Scottish General Hospital.*—Captain William A. I. Fortescue, M.B., resigns his commission, dated October 9, 1909.

*Attached to Units other than Medical Units.*

Lieutenant Harry Armitage Robinson, M.D., to be Captain, dated September 28, 1909.

The transfer of Surgeon-Lieutenant Lloyd Turton Price, M.B., from the 1st Forfarshire Royal Garrison Artillery (Volunteers), which was announced in the *London Gazette* of November 6, 1908, is cancelled.

**QUEEN ALEXANDRA'S IMPERIAL MILITARY NURSING SERVICE.**

The following ladies have received appointments as Staff Nurse: Miss M. S. Mason, Miss E. J. French, Miss G. F. V. Temperley, Miss G. A. J. Lloyd, Miss E. S. Killery, Miss E. Lowe, Miss N. Molloy, Miss R. M. Rooke.

*Postings and Transfers.*—Matrons: Miss E. A. Dowse, R.R.C., to Egypt, from Malta; Miss M. Wilson, to Cosham, from Cork. Sisters: Miss K. M. Bulman, to Cambridge Hospital, Aldershot, from Malta; Miss H. Hartigan, to Cottonera, from Valletta; Miss M. R. Makepeace, to Devonport, from Cork; Miss A. Rowe, to Cosham, from Devonport; Miss L. E. C. Steen, to Cork, from Cosham. Staff Nurses: Miss M. S. Mason, to Netley, on appointment; Miss E. J. French, to London, on appointment; Miss N. Molloy, to Connaught Hospital, Aldershot, on appointment; Miss G. F. V. Temperley, to Woolwich, on appointment; Miss G. A. J. Lloyd, to Connaught Hospital, Aldershot, on appointment; Miss B. M. Nye, to Tidworth, from Woolwich; Miss M. J. Hepple, to Cottonera, from Valletta; Miss C. E. A. Harries, to Colchester, from Connaught Hospital, Aldershot; Miss R. M. Rooke, to Woolwich, on appointment; Miss D. M. Smith, to South Africa, from Shorncliffe; Miss M. C. Watson, to Cork, from Woolwich; Miss I. M. Johnston, to Chatham, from Netley; Miss M. E. Medforth, to Netley, from Chatham.

*Arrivals.*—Miss K. M. Bulman, Sister, from Malta.

## ROYAL ARMY MEDICAL COLLEGE.

EXAMINATION OF LIEUTENANTS, ROYAL ARMY MEDICAL CORPS AND INDIAN MEDICAL SERVICE, AT THE CLOSE OF THE SECOND SESSION, 1909.

*Hygiene.*—Written Examination. Tuesday, October 26, 1909. From 10 a.m. to 1 p.m.

(1) What are the essential characteristics of a good water-closet? Mention the good and bad points of the following:—

- (a) Wash-out closets.
- (b) Wash-down closets.
- (c) Valve closets.
- (d) Trough latrine.

(2) State briefly the characteristics of water drawn from the following sources:—

- (a) A shallow well in an agricultural district.
- (b) A deep well in the chalk.
- (c) A moorland stream.
- (d) A large pond.

With troops in camp what precautions would you take if water from (a) and (b) was the only source of supply?

(3) What is sewage? What is its composition from a mechanical point of view? Define sludge, and detail the various ways in which it may be disposed of, giving the various advantages and disadvantages of each method.

(4) Under what conditions can a man become a focus of enteric fever amongst his comrades? Through what channels does he communicate the disease to them?

(5) In the case of an isolated body of men, amongst whom enteric fever has broken out, how would you proceed to identify the man acting as the actual focus of disease?

Practical Examination. Saturday, October 23, 1909. From 10 a.m. to 1 p.m.

Complete the following analysis where left blank:—

					Parts per 100,000.
Chlorine ..	..	..	..	..	
Ammonia (free) ..	..	..	..	..	
Ammonia (albuminoid) ..	..	..	..	0.01	" " "
Nitrites ..	..	..	..	..	" " "
Nitrates ..	..	..	..	0.2	" " "
Oxygen absorbed (in 15 minutes) ..	..	..	..	..	" " "
Hardness. Total ..	..	..	..	..	" " "
Fixed ..	..	..	..	..	" " "
Total solids ..	..	..	..	50	" " "
Volatile solids ..	..	..	..	30	" " "
Metals ..	..	..	..	Nil.	" " "

The water sample is yellowish in colour, and there is considerable sediment.

Microscopically wood and linen fibres are seen.

Give an opinion on—

(a) The probable source of water.

(b) Its fitness for drinking or other purposes.

Pathology.—Written Examination. Monday, October 25, 1909. From 10 a.m. to 1 p.m.

(1) What are the principal changes found in the peripheral blood in the following diseases.—

Spleno-medullary leucocythæmia; chlorosis; Banti's disease?

(2) In the light of recent experimental research discuss the manner in which epidemic plague extends, and describe shortly the principal cultural characteristics of the *Bacillus pestis*.

(3) Define the following expressions:—

(a) Negative phase.

(b) Symbiosis.

(c) Pfeiffer's phenomenon.

(d) Microgamete.

(e) End-point of agglutination.

(f) Sporozoite.

(4) What are the principal pathological lesions which may be found in cases of infection with the *Bilharzia hæmatobia*? Discuss the possible method of infection in this disease.

Practical Examination.—Friday, October 22, 1909. From 10 a.m. to 1 p.m.

(1) Examine the bacterial culture marked with your examination number and write in your paper a short account of what you have found. Leave two stained specimens of the organisms, one of them a "Gram" specimen, beside your microscope, properly labelled.

(2) Stain and examine the blood film marked with your number and record in your paper—

(a) The relative proportions of the leucocytes.

(b) The presence or absence of bacterial or protozoal organisms.

Leave your specimen in focus under your oil-immersion lens.

(3) Stain the paraffin section so as to demonstrate the presence of acid-fast bacteria. Label your specimen and leave it beside your microscope.

Military Surgery.—Friday, October 22, 1909. From 2.30 p.m. to 5.30 p.m. [N.B.—Twenty-five marks for each question.]

(1) In what ways may a gunshot wound become infected, and what should be done to prevent infection occurring?

(2) Discuss the conditions that render amputation necessary for a gunshot wound, and state at what period amputation should be performed in each case.

(3) Describe the varieties of gunshot injury met with in the shaft of the femur, and give an outline of their treatment (a) on the field, (b) during transport, and (c) at a fixed hospital.

(4) Discuss the diagnosis, prognosis, and treatment of penetrating gunshot wounds of the abdomen.

*Tropical Medicine.*—Monday, October 25, 1909. From 2.30 p.m. to 5.30 p.m.

(1) What conditions tend to the occurrence of hæmorrhage in enteric fever? What steps would you take to anticipate and prevent such an accident?

(2) Sketch a line of treatment for a case of chronic bacillary dysentery.

(3) Mention four principal causes for the occurrence of coma in a young man living in the Tropics. Discuss briefly the differential diagnosis between them.

(4) Describe the symptoms of a case of bubonic plague, and state what diseases it might be confounded with.

*Military Medical Administration.*—Saturday, October 23, 1909. From 2.30 p.m. to 5.30 p.m.

(1) Under what code of law is the Army governed? How do the Territorial differ from the Regular Forces in this respect?

(2) (a) What happens to a man's kit on his being admitted to hospital?

(b) What steps would you take were a patient under your charge taken seriously ill?

(3) What are the chief sanitary duties of a medical officer in charge of troops in barracks?

(4) How are lunatic soldiers disposed of?

(5) How is a "Dressing Station" formed, and what rules would guide you in the selection of its site?

## THE ARMY MEDICAL OFFICERS' WIDOWS' AND ORPHANS' FUND, INSTITUTED JANUARY, 1816.

*President.*—Surgeon-General Sir A. Keogh, K.C.B., M.D., K.H.P., Director-General.

*Vice-President.*—Deputy-Surgeon-General C. A. Innes, M.D.; Deputy-Surgeon-General W. G. Don, M.D.

*Trustees.*—Lieutenant-Colonel J. Martin; Lieutenant-Colonel J. Stevenson, M.D.; Deputy-Surgeon-General C. A. Innes, M.D.

*Committee for 1909-10.*—Surgeon-General Sir W. D. Wilson, K.C.M.G.; Lieutenant-Colonel W. Grant Macpherson, M.D., C.M.G.; Lieutenant-Colonel A. M. Davies; Lieutenant-Colonel M. W. Russell; Surgeon-General W. S. M. Price; Colonel J. Lane Nottter, M.D.; Major E. L. McSheehy, M.D.; Lieutenant-Colonel A. F. S. Clarke, M.D.; Major W. H. Horrocks, M.B.

*Auditors.*—Messrs. Deloitte, Plender, Griffiths and Co., Chartered Accountants.

*Consulting Actuary.*—H. W. Andras, Esq., F.I.A.

*Honorary Treasurer.*—Sir James R. D. McGrigor, Bart.

*Bankers.*—Sir C. R. McGrigor, Bart., and Co., 25, Charles Street, St. James's Square (to whom all subscriptions should be paid).

*Secretary.*—Captain J. T. Clapham, 20, Belgrave Road, Westminster.

Attention is invited to the benefits offered by the above Society, which have been much improved by the amendment of the rules in 1906. It is hoped that officers considering the question of life assurance will investigate the strong financial condition of the Fund, and compare its terms with those offered by other Societies. In so doing it must be borne in mind that *these terms cover all war and climate risks.*

Under the new rules the widow's annuity of £50 is continued after her death to her child, or children, until the youngest surviving child shall have attained the age of twenty-one years. Further, should the wife of a member predecease him, it is optional

for him to continue the subscription which he has been paying, to provide for her children up to the age of twenty-one, in the event of his death. A new scale of subscriptions has been brought into force, of which some examples are given below. Where the wife is the elder the annual premium is less.

Husband's age, 25	..	Wife's age, 25	Ann. Subs., £12 6 5
" " 30	..	" " 25	" " 14 18 6
" " 30	..	" " 30	" " 13 9 10
" " 35	..	" " 30	" " 16 14 5
" " 35	..	" " 35	" " 14 17 6
" " 40	..	" " 35	" " 18 17 7
" " 40	..	" " 40	" " 16 9 10
" " 45	..	" " 40	" " 21 8 6
" " 45	..	" " 45	" " 18 7 7
" " 50	..	" " 50	" " 20 11 1

There is a class of unmarried members who pay £2 a year. They are allowed the equivalent of the total of their subscriptions, at compound interest, by way of reduction of their annual subscription when becoming married members. There are no marriage fines for members joining under the new rules.

At the last quinquennial valuation of the assets and liabilities of the Fund, as at December 31, 1905, the Actuary reported that "the financial position of the Society was eminently satisfactory"; there being a net surplus of £64,390 after providing for annuities, immediate and contingent, to all widows of members.

The funds of the Society at that date amounted to £125,419. On December 31, 1908, their total value was £131,279; of this sum £115,000 is in Government securities.

At the end of the year 1908 there were 126 members, of whom 14 were unmarried.

A copy of the Rules, the latest Annual Report, and other particulars can be obtained from the Secretary, Captain J. T. Clapham, 20, Belgrave Road, Westminster.

## UNITED SERVICES MEDICAL SOCIETY.

THE next meeting of the above Society will be held at the Royal Army Medical College, Millbank, S.W., on Wednesday, December 8, 1909, at 8.30 p.m., when a paper will be read by Fleet-Surgeon F. H. A. Clayton, R.N., on "Notes on Seven-day Fever of Eastern Ports. Its occurrence in the Navy, and its relation to Dengue."

## BIRTH.

CREE.—At Rochester, Kent, on November 6, 1909, the wife of Lieutenant-Colonel H. E. Cree, R.A.M.C., of a son.

## DEATHS.

LINDSAY.—At Curdridge, Hants, on October 15, 1909, Surgeon Robert Lindsay, M.B., Army Medical Department (half-pay), aged 72. He entered the Service on December 14, 1858; served on the Staff in the 39th and 75th Foot, and in the Army Medical Department. He became Surgeon July 21, 1863, and retired on half-pay on March 5, 1874.

COATS.—At the Sisters' Quarters, Military Hospital, Tidworth, on November 2, 1909, Miss C. A. Coats, Staff Nurse Q.A.I.M.N.S., aged 33. She entered the Service on May 7, 1906, and served at Queen Alexandra's Military Hospital, Millbank, until she was transferred to the Military Hospital, Tidworth, on January 15, 1908.

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### EXCHANGES, &c.

*The charge for inserting Notices respecting Exchanges in the Royal Army Medical Corps is 5/- for not more than five lines, which should be forwarded by Cheque or P.O.O., with the notice, to Messrs. G. STREET and CO., Ltd., 8, Serle Street, London, W.C., not later than the 22nd of the month.*

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		£ s. d.	£ s. d.	s. d.	s. d.	s. d.	s. d.
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	8	0 4 6	0 2 0				
	16	0 7 6	0 3 6				
25	4	0 3 0	0 1 3	4 0	1 3	3 6	0 9
	8	0 5 6	0 2 6				
	16	0 9 6	0 4 6				
50	4	0 4 0	0 1 8	5 0	1 9	4 0	1 0
	8	0 6 9	0 3 2				
	16	0 12 0	0 5 3				
100	4	0 5 6	0 2 9	6 6	3 3	5 6	2 0
	8	0 9 0	0 4 4				
	16	0 16 9	0 6 9				
200	4	0 8 6	0 4 0	9 0	6 3	7 6	4 0
	8	0 13 6	0 6 0				
	16	1 3 6	0 8 9				

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The back outside cover is not available for advertisements.

## Notices.

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### EDITORIAL NOTICES.

The Editor will be glad to receive original communications upon professional subjects, travel, and personal experiences, &c. He will also be glad to receive items of news and information regarding matters of interest to the Corps from the various garrisons, districts, and commands at home and abroad.

**All such Communications or Articles accepted and published in the "Journal of the Royal Army Medical Corps" will (unless the Author notified at the time of submission that he reserves the copyright of the Article to himself) become the property of the Library and Journal Committee, who will exercise full copyright powers concerning such Articles.**

Matter intended for the Corps News should reach the Editor not later than the 15th of each month for the following month's issue. Notices of Births, Marriages, and Deaths are inserted free of charge to subscribers and members of the Corps. All these communications should be written upon one side of the paper only; they should by preference be type-written, but, if not, all proper names should be written in capital letters (or printed) to avoid mistakes, and be addressed The Editor, "JOURNAL OF THE ROYAL ARMY MEDICAL CORPS," War Office, Whitehall, London, S. W.

Communications have been received from Captain F. Harvey, Captain R. T. Brown, Brevet-Colonel R. H. Firth, Major A. P. Blenkinsop, Major C. E. Pollock, Major S. L. Cumming, Major W. S. Harrison, Major J. A. Balck, Colonel R. H. Forman, Major H. E. Winter, Colonel R. Macrae, I.M.S., Captain G. Ormrod, Captain B. M. H. Rogers, R.A.M.C. (T. F.), Captain C. C. Cumming, Captain A. D. Jameson, Major C. W. Duggan, Major M. P. Holt, Lieutenant-Colonel R. C. Cottell, Captain J. G. Churton.

The following publications have been received :—

*British: The Journal of Tropical Medicine and Hygiene, The Middlesex Hospital Journal, The Hospital, Journal of the United Service Institution of India, The Lancet, Army and Navy Gazette, Guy's Hospital Gazette, Transactions of the Society of Tropical Medicine and Hygiene, Journal of the Royal Sanitary Institute, The Royal Engineers' Journal, The Practitioner, Public Health, Medical Press and Circular, The Medical Review, St. Bartholomew's Hospital Journal, On the March, Shield, The Natal Agricultural Journal, Journal of the Royal Institute of Public Health, Red Cross and Ambulance News, The All-India Hospital Assistants' Journal, The Journal of Tropical Veterinary Science, Indian Civil Veterinary Department Memoirs.*

*Foreign: Giornale di Medicina Militare, Archives de Médecine et de Pharmacie Militaires, Annales D'Electrobiologie et de Radiologie, United States Naval Medical Bulletin, Campagne Antipaludigne, Japanese Journal, Revista de Sanidad Militar y La Medicina Militar Española, Bulletin de l'Institut Pasteur, Boletín de Sanidad Militar, Le Caducée, Deutsche Militärärztliche Zeitschrift, Bulletin of The Johns Hopkins Hospital, Norsk Tidsskrift für Militærmedicin, Archiv für Schiffs- und Tropen-Hygiene, Militärgeographie, The Military Surgeon.*

## MANAGER'S NOTICES.

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